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# THE RHODESIA Agricultural Journal.

*Edited by the Director of Agriculture,  
assisted by the Staff of the Agricultural Department.*

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## Editorial.

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*Correspondence on subjects affecting the farming industry of Southern Rhodesia is invited. Enquiries will be replied to direct, or through the medium of the JOURNAL. An interchange of ideas and suggestions between farmers will be particularly welcomed. Contributions of a suitable nature for insertion in this JOURNAL will be much appreciated. All communications regarding these matters, and advertisements, should be addressed to the Editor, Department of Agriculture, Salisbury.*

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LECTURES ON AGRICULTURE.—The second annual course of instruction given under the auspices of the Department of Agriculture was successfully conducted during the month of August at Salisbury. The series comprised some sixty lectures in all, delivered by the technical officers concerned with arable farming, agricultural chemistry, the study of insect pests, farm engineering, veterinary science, and the principles and practice of stock breeding and raising, while three lectures on first aid were delivered by Dr. L. J. Orpen, of the Medical Department. In addition to these lectures, at which there was a constant attendance of about fifteen, evening addresses were given on a variety of subjects allied to the farming industry, and proved popular and instructive to many who were unable



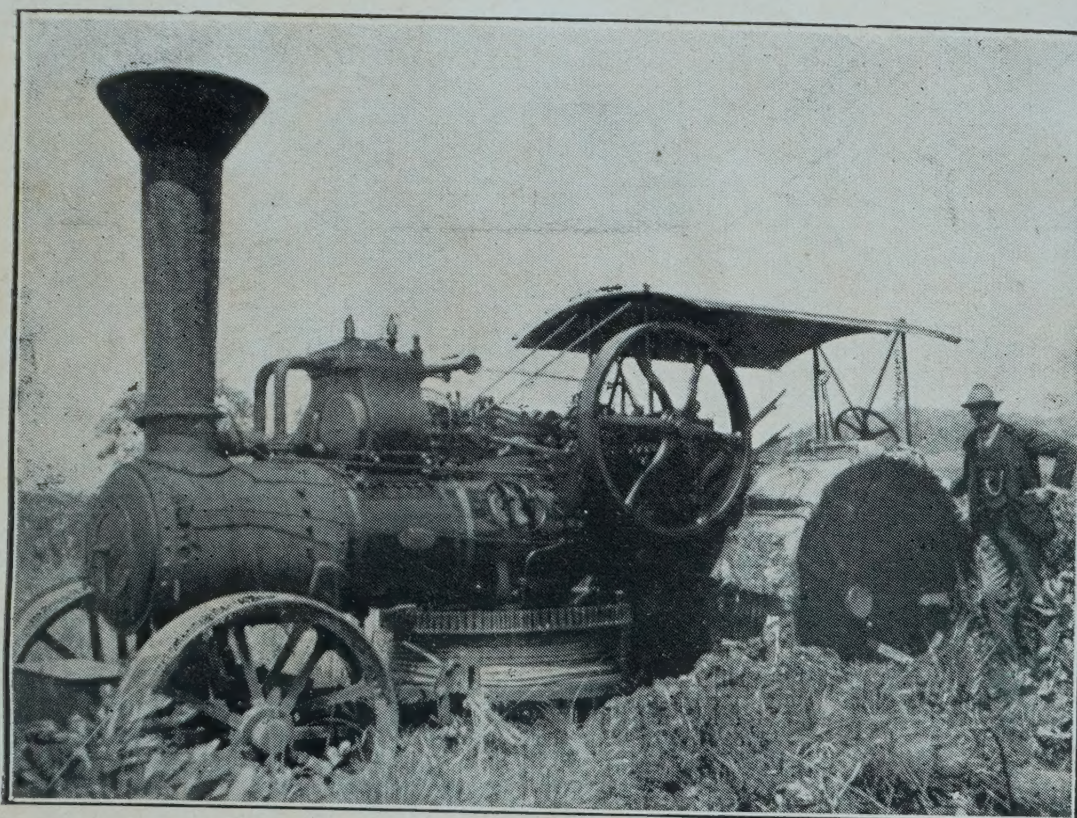
to attend during the day. It is occasionally suggested that these lectures should be published. Readers of the *Journal* have been furnished through its pages with much of the information provided in the course of the lectures, but necessarily not in the same form, for the methods of oral and systematic instruction on scientific principles, coupled with explanations in detail and practical demonstrations, are not compatible with, nor possible in, written communications. There is much which can only be taught by word and practical demonstration, and no writing can establish that understanding and relationship which exist between teacher and student. On the other hand, this *Journal* is the repository of information of an educative character on agricultural topics, with special reference to local conditions, and in its back numbers will be found papers dealing with most of the subjects discussed in these lectures. We hope, however, to publish the subject matter at least of certain of the evening lectures which, being self-contained and comprehensive, lend themselves to reproduction in print.

The medal given for the highest aggregate of marks in the examinations following on the course of instruction was gained by Mr. J. A. O. Fraser-Mackenzie, of the Ripple Creek Estate, Umvukwe, who also carried off the prizes in agriculture, agricultural chemistry, and economic entomology. The prize for veterinary science was gained by Mr. W. Eldred, of Long Valley Farm, Umboe; for agricultural engineering, by Mr. E. Hardcastle; whilst in live stock the winner was Mr. S. J. Inge, of Langton, Umboe. Those attending the lectures were mainly young farmers or those about to farm, and were of a higher average age than was the case last year. A few ladies graced the lectures on dairying and arable farming—a welcome sign of interest and enquiry.

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EXCURSIONS OF INSTRUCTION.—In connection with the course of instruction referred to in the foregoing, visits were paid by the students to various places of specific interest, agriculturally, in the vicinity of Salisbury, and here, as far as was possible, the lessons of the lecture room were amplified by practical demonstration. The excursions were to Mr. H. W. Ross's farm, Bluffhill, the Government Experiment Farm, Gwebi, and Messrs. Pretorius and Short's farm, M'Guta.





Steam Ploughing, M'Guta.



Steam Ploughing, M'Guta.







The principal object of the visit to Mr. Ross's farm was to shew the students how a herd of dairy cattle was being maintained and utilised for the production of milk for the Salisbury market. The herd, consisting for the most part of pure and grade Friesland cattle, contained some very fine specimens. Feeding consisted mainly of ensilage, teff grass hay, and ordinary veld grass hay, supplemented by other more concentrated foods, such as mealies and beans. The students were also shewn a cob and corn grinder utilised by Mr. Ross for grinding roughly the whole cob—a form of food which is to be recommended, as the core, in addition to being useful as a mixture with the maize, contains a small amount of nutriment in itself.

Although at the time of the visit to the Gwebi Experiment Farm most of the crops had been harvested, there was much that was interesting and instructive to be seen. The winter cereals growing in moist land without irrigation in particular formed a useful object lesson, and were examined with great interest by the visitors. The method by which seed mealies are selected and sold to farmers of this country was demonstrated, the students being able to see the system actually in progress. The buildings and machinery in use at the farm were the objects of considerable attention, and much useful information was imparted during inspection. The herd of Friesland cattle, a fine Shorthorn bull, a flock of Merino sheep, and some pure-bred black pigs were shewn to the students, the points of the various animals and the method of feeding and treatment fully explained. The Friesland bull, "Colantha Sir Cornucopia," imported from America by Messrs. Maclaurin Bros., and purchased from them at the dispersal sale by the Government, was the cynosure of all eyes. The animal has grown out finely, and looked in the pink of condition. In connection with the stock at the farm, it was explained that the Government hoped to establish a stud farm at Gwebi for the purpose of breeding bulls for distribution among farmers. With regard to the sheep, rams are sold at a fixed price of £4 per head.

The visit to M'Guta afforded an excellent example of what can be accomplished by energy and enterprise. To those who had not visited this farm since its acquisition by the present owners, the improvements made were a revelation. A remark-



able transformation has been effected, and the panorama of cultivated lands and growing crops that came into view as the descent of the Golden Stairs was commenced was indeed a pleasing one. Messrs. Pretorius and Short have here 12,000 acres, of which they hope ultimately to bring some 5,000 acres under cultivation. At the time of the visit about 1,200 acres had been broken up for mealies, and it was hoped to have 2,000 acres ready by planting time. Working on such a scale as this, it is, of course, necessary to plough expeditiously, and the owners of the farm have resorted to steam ploughing by the double engine system. This was in operation at the time of the visit of the students, and was watched with very great interest. Messrs. Pretorius and Short estimate that about 15 acres per day can be turned over by this plant. The work done by a clod packer hauled behind the plough was much admired, while a disc harrow, which was later connected with the cables and drawn across the land at a speed of six to eight miles per hour, did excellent work. A demonstration of tree stumping by the engines shewed their enormous power.

There is an excellent water supply on the farm, and the visitors inspected with much interest the irrigation scheme instituted by the present occupiers of M'Guta. It is estimated that with the present supply some 200 acres can be irrigated, but sites for reservoirs to store up to 100 million gallons of water were pointed out. In addition to the irrigable area, the farm possesses some 600 acres of moist vleiland suitable for winter crops. At the time of the visit crops of onions, potatoes, barley, oats, malt barley, rye, and lucerne were being grown under irrigation, all of which were thriving. The lucerne especially was growing splendidly, and was one of the finest patches we have seen in the country. The crop was sown in May, and it is interesting to note that at the time of writing—September—cuttings are being marketed in Salisbury. Other items of interest pointed out were the citrus orchard, consisting of approximately 1,500 trees, watered by gravitation, and two lime kilns, where rock lime, of which there are large deposits on the farm, was being burnt for building purposes. The farm is one of great possibilities, and the visitors returned much impressed with all they had seen.



THE PROPOSED BACON FACTORY.—The question of the establishment of a bacon factory in Southern Rhodesia has again been raised, and practical proposals have been put forward for the erection of a building capable of dealing with fifty pigs a week. So far no insuperable difficulties have been encountered in the preliminary steps which have been taken. The main factor to be considered is the reliable supply of pigs of about 160 lbs. to 200 lbs. live weight; preferably about 180 lbs. on an average. At 4d. per pound live weight, the price of such pigs would be about £3 each, and they should reach this size and be in suitable condition at ten months to a year old, or, if well fed, at a less age. It is suggested that the factory should be conducted on the same lines as the Gwelo Creamery, viz., that in the first instance the factory should be established by the British South Africa Company, and that after expenses have been met and allowances made for depreciation, etc., and interest at 6 per cent. on the capital outlay paid, the remainder of the profit be divided equally between the Company and the supporters of the factory. It would be of material assistance towards the carrying out of the project if farmers who would be prepared to supply pigs of the class indicated will kindly notify the fact to the Director of Agriculture, Salisbury. Correspondents are requested to state, as far as they can at this early stage, the number of pigs per annum they would be likely to offer, and the months of the year during which they could be delivered. The actual purchase would, of course, be in the hands of the manager of the factory, who would only select suitable pigs, and it should be clearly understood that animals found to be infested with measles would be rejected. It is within the powers of any breeder to take preventive measures against this horrible disease, which renders the meat quite unfit for human consumption. A bacon factory is the natural corollary of a butter factory such as we have now at Gwelo; and no doubt the farmer who sends cream away and has a quantity of separated milk left over, will be the chief supplier of the bacon factory; but those without this valuable item can also advantageously feed pigs, especially where, as is so often the case now, other crops besides mealies are largely grown. As indicated, some assurance is desired from those who are willing and able within the next few months to provide the necessary



pigs, so that this project—so frequently mooted and so often, from one cause or another, shelved—may be carried to a successful issue. A committee of farmers has been established at Salisbury to endeavour to put the proposal into effect.

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**SALISBURY AGRICULTURAL SHOW.**—It is always difficult to hold a successful agricultural show when cattle have to be eliminated from the list of exhibits. The uncertainty which has existed in the past year with regard to what regulations might be necessary in respect of the movement of cattle rendered it impossible to organise the Salisbury Show with the confidence required in undertaking a venture of this nature. Nevertheless, this show, the last of the annual series held throughout this Territory, proved a greater success than was anticipated, and all concerned are to be congratulated upon the result of their efforts. Cattle could only be represented by a few slaughter classes, and the instructive competition produced thereby is dealt with elsewhere in this issue.

The implements and machinery display was a special feature of the show, and an indication of the trend of the times was the number of small power plants on view suitable for replacing manual labour on the farm. Up-to-date implements and labour-saving machinery are sought after in Rhodesia at the present time, and we are pleased to see our local firms meeting the demand in such an enterprising manner. The exhibition generally was highly creditable and of great educational value, and may be taken as a fair indication of the manner in which the farming industry is progressing.

The produce shed was well and attractively filled with a great variety of grain of all kinds, hay, root crops, monkey nuts, tobacco, vegetables, butter, cheese, jams, preserves of all sorts, bread, cakes and other domestic exhibits. Although the entries were good, too many farms were unrepresented, and we would like to see a more comprehensive exhibit at the next show. The samples tabled frequently shewed a lack of appreciation by the exhibitors of the points of merit of such produce as pumpkins, beans, buckwheat and cereals generally, but it is one of the chief objects of a show to demonstrate shortcomings





Selected Seed Maize, Gwebi Experiment Farm.



Majorda Melons, Gwebi Experiment Farm.







of this nature, and to point the way in which improvement can be effected. Mazoe and Enterprise only entered for the district competition, but the exhibits were extremely creditable and worthy displays of the activities and potentialities of these districts.

In the maize section the entries were numerous, and the quality of the exhibits distinctly high. It is to be regretted that there was no separate class for Salisbury White, which is rapidly becoming the chief mealie of a large section of Mashonaland, and which has now reached a sufficient degree of fixity, both as regards cob and corn, to warrant a class of its own. The Hickory King exhibits were second only to those shewn at Umtali, but Boone County and one or two other imported varieties shewed the defect which farmers of this country have endeavoured to eliminate from the locally-grown product, viz., an unusually thick core, giving the mealie apparent great size, but yielding comparatively a smaller percentage of grain.

In the tobacco section competition was keen in the Virginia cigarette leaf class, and several exhibits which could not take prizes were highly commendable. Pipe tobacco was rather heavy, and could have been improved upon. Some of the cigar tobaccos were very good, considering this type was grown for the first time, though, of course, it still remains to be seen what the leaf will be like after fermentation. Samples will be sent to manufacturers, and we hope to have something to say later regarding this matter. At the present time we do not advise growers to proceed beyond the experimental stage with cigar leaf, but the results achieved so far are distinctly encouraging, and give us ground for believing there is a promising future for this type of leaf in Rhodesia. On the whole the tobacco exhibits were very good, considering the time growers had for preparing their samples. Had they known earlier the date the show would be held there would undoubtedly have been more and better exhibits, and it is to be hoped that circumstances will permit growers making due preparations next year. A special prize and a gold medal were awarded to Mr. S. Koefman for a collection of Rhodesian cigars and pipe tobaccos.



The small stock section was not greatly patronised, there being only two exhibitors of pigs and three or four of goats and sheep. The quality was as good as could be expected under present circumstances, but it is to be hoped that future shows may see a large increase in this class of stock.

The poultry exhibits were very fair, but improvement is needed in the preparation of birds for show.

Horses and mules proved a considerable attraction, and the arrangements for exhibiting them were good. When one considers the risk involved in keeping horseflesh in this country it is not surprising that the class of animals shewn were not as a rule of the best. The general turn-out, however, of the entries compared most favourably with that seen at the leading shows in the Union.

While writing on this subject, we may perhaps be pardoned for emphasising the necessity of special preparation for all classes of exhibits at shows. This does not mean that animals should be unduly fat, but it does mean that they should be in the pink of healthful condition and clean. The value of advertisement can hardly be over-rated in these days of keen competition, and we would assure exhibitors of stock, produce or implements that a "well-got-up" exhibit takes the eye of the public infinitely more than one put on in a slovenly manner.

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AGRICULTURAL CO-OPERATION.—Much has been written regarding the possibilities of co-operation in the advancement of the agricultural industry, and so much enthusiasm is displayed by its protagonists that the subject has become a "cause," and its advocacy a "propaganda." Discussion of the subject is apt to become either platitudinous or so immersed in technicalities and detail as to be confusing, but we are pleased to be able to publish in this number an article written by Mrs. Malcolm, at present visiting Rhodesia, which explains in lucid and simple language the working of agricultural co-operation in Ireland in the direction of sale, purchase and insurance. The article indicates the lines along which similar undertakings might be successful here, provided methods were adapted to suit our peculiar conditions, and will, we are sure, be perused with interest by our readers.



IMPORTATION OF STOCK FROM ENGLAND.—The following stud animals have recently been purchased by the Department of Agriculture on behalf of various farmers, and are now undergoing inoculation at the Letombo Inoculation Camp:—10 Shorthorn bulls (Coates dairy type), 9 Shorthorn bulls (Coates beef type), 1 South Devon bull and 5 heifers, 7 Hereford bulls and 3 heifers, 3 North Devon bulls, 5 Red Lincoln bulls, 2 Sussex bulls. All these animals have been carefully selected for the purpose for which they are required, and are, generally speaking, good. A few of the bulls are of exceptional merit, but unfortunately these are too mature to withstand inoculation. The dairy bulls are true to type, but naturally do not “fill the eye” like a beef animal, especially as they are in rather more store condition than the beef types.

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LECTURES AT MEETINGS OF FARMERS' ASSOCIATIONS.—It is regretted that it is not found possible, owing only to the many calls on the time of our technical staff, to meet all requests for lectures or to accept all invitations to attend meetings. Dates are very apt to clash, and distances are great, but every effort is made to arrange for the presence of officers of the Department whenever sought. Secretaries are, therefore, reminded to communicate early with the Department on these subjects, whilst those who have not done so are requested to furnish the dates of their meetings for publication in this *Journal*.

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MAIZE EXPORT RATES.—In view of the very heavy crops in portions of Mashonaland and the possibility of there being a surplus over and above local requirements, it will be a matter for satisfaction to many to know that the negotiations of the British South Africa Company with the shipping lines have been successful in securing an export rate for Rhodesian maize, which will enable the present flat rate of 3s. per bag from any station in the Territory to England to continue to the end of next year, up to a maximum of a hundred thousand bags, a quantity not likely to be realised. This should go far to allay anxieties, especially when we consider the growing market for maize in the Congo and the increasing use of the grain on the farm as fattening food for cattle and pigs.



RECIPROCITY IN EXPORTS AND IMPORTS.—It will be a matter of much satisfaction to our farmers, especially to those on the eastern border of this Territory, and to breeders of stud stock, to learn that under a decree published in the *Government Gazette* of the Mocambique Company, dated 19th August, 1913, the products of Rhodesian soil shall be exempt from Customs duty when imported into the Mocambique Company's territories, when similar products of the latter enjoy a like exemption on importation into Rhodesia. Under Government Notice No. 161 of 1910, "all animals bred, and raw produce grown, within the Portuguese Province of Mocambique, south of the Zambesi," are admitted free of Customs duty into Southern Rhodesia. Prior to the decree of reciprocity referred to, such items as grain, tobacco, potatoes, onions and timber, etc., produced in Rhodesia, have been subject to a duty on importation into Mocambique Territory.

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REBATE ON IRRIGATION MATERIAL.—The Beira and Mashonaland and Rhodesia Railways announce that the old form of rebate certificate for materials used in irrigation works on farms has been discontinued. Certificates will no longer be required from the Department of Agriculture in the first place, but rebates will be granted on a certificate signed by the farmer on whose land the works are to be erected. Rebate is now allowed on the following materials:—Cement, water pipes, valves, fittings, sluice gates, engines (for permanent embodiment in irrigation works), pumps, windmills, tanks, troughs, tubes for lining wells, and such other materials as may at the discretion of the Railways be admitted from time to time, as necessary for the construction or enlargement of any permanent irrigation work. The form of certificate necessary to obtain the rebate will be supplied by the District Traffic Superintendents at Beira, Salisbury, Bulawayo, and Livingstone on application.

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ROOT GALLWORM.—We notify for general information that the Chief of the Division of Entomology at Pretoria reports that the pest known as Root Gallworm or Root Knot Belworm (*Heterodera radici-*



*cola*) is present in nearly all the vine nurseries of the Western Province. The pest is not sufficiently harmful to vines to justify the imposition of quarantine by the Union authorities, nor is the danger to this Territory sufficient to justify the placing of an embargo on all vines from this part of the Union, especially as vines from other parts are also liable to be infested. The nurserymen have been warned to exercise care in avoiding the despatch of infested plants, but it is not possible for complete immunity to be ensured in this way. Purchasers of vines should, therefore, examine the roots of the plants for swellings before planting. It is pointed out, however, that it is safer to grow vines from cuttings than to use the rooted plants. Root Gallworm flourishes mostly in soils under irrigation and those that do not dry out very deeply in the dry season. The pest is very destructive to all produce of the kitchen garden. The fact that grape vines are not planted in this Territory except about houses renders the fact that vines may be infested of less importance than a similar infestation of seed potatoes, but it is within the bounds of possibility that soil from an infested garden adhering to boots, feet, implements, etc., or flood water might carry the pest to valuable irrigated land, where the results tend to be disastrous. Farmers should, therefore, take warning. Root Gallworm, of course, already occurs on many farms within the borders of the Territory. An illustrated article on the subject of this pest appeared in this *Journal* for June, 1913.

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**TSETSE FLY AREAS.**—For the purpose of combating tsetse fly, portions of the Sebungwe and Hartley districts have been thrown open for the free and unrestricted shooting of all classes of game, with the exception of ostriches and other game birds. Description of the areas will be found in Government Notices Nos. 200 and 227, published at the end of this *Journal*. The Veterinary Department will be very glad to receive smears from the blood or spleen of animals shot for investigation purposes.

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**TOBACCO.** Tobacco growers will be now preparing their seed beds and making arrangements for working the next crop. It may be opportune, therefore, to notify beginners and



others who have little knowledge of the crop that full information on the subject is given in the "Handbook of Tobacco Culture," published recently, and which can be obtained from the Department of Agriculture for 2s. 6d. There appears to be a general idea throughout Rhodesia that we have reached the stage of over-production. Whether this be true or not, it is time to take warning and to plant only such acreages as can be well tended. Most growers will agree that in the past crops could have been handled much better if the acreage had been smaller, and consequently a larger quantity of good tobacco obtained per acre. Demand ~~fixes~~ the price of tobacco, and if, as some people think, our next step is to export, then we must have at least as good an article to offer as our competitors. With cheap land and labour there appears to be no reason why this country cannot compete in the overseas markets once our tobacco is established, but this may take several years, and we may have to sell at a very small profit at first.

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OUR CONTRIBUTIONS.—The article contributed by Mr. A. Curtis on closer settlement is peculiarly opportune, and shews that the subject is receiving widespread and practical consideration. No doubt anything can be proved by figures, but when these are based on experience they are not easy to controvert, and Mr. Curtis's statements deserve to be studied. We would welcome further expression of opinion on this subject, especially with regard to the area of small holdings, the profits to be derived therefrom, and the capital necessary for profitable working. There can be no doubt that at the present time the process of subdivision of farms and of occupation of smaller areas than was at one time considered feasible is going on unostentatiously, but to quite a considerable extent, by natural processes and without adventitious aid.

Another article in this issue to which we would direct special attention is one contributed by Mr. Blackshaw, Government Agricultural Chemist, dealing with the purchase of fertilisers. The article is written with the object of enabling farmers to obtain the best value for their money, and explains clearly how the relative commercial values of fertilisers belonging to the same class may be determined. As Mr. Blackshaw



points out, the price per ton is not the sole guide in determining the cheapness of different brands, the guarantee accompanying the fertiliser having also to be taken into consideration.

In consequence of an insistent enquiry for information on the subject, we reprint in this number an article which appeared in the *Journal* some two years ago on brickmaking, written by Mr. G. T. Dyke. Bulletins have been printed of the article, and are now available for distribution. If any further information on the subject is required, or anything written is not quite understood, Mr. Dyke has kindly promised to assist in any way he can, and enquiries may be addressed to him direct at Bosbury Farm, Hartley.

The article written by Mr. Walters on Rhodesian maize will, we are sure, be perused with much interest. Mr. Walters is particularly well qualified to write on this subject, and his remarks should be well studied.

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PLEURO-PNEUMONIA IN THE TATI CONCESSION.—It will be a matter of satisfaction to Rhodesian cattle breeders to know that we are authoritatively informed that no case of lung-sickness has been detected in the Tati Concession for a period of over two years, since the outbreaks at Tsessebe and Francistown,



## Extracts from the Report of the Agriculturist and Botanist for the Year 1912.

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PROGRESS AND RESULTS OF EXPERIMENTAL WORK.—Three and a half years ago, when the experimental work of this branch of the Agricultural Department was commenced, Southern Rhodesia was practically a one-crop country. Maize was the standard summer crop, and, in addition, very limited areas of potatoes, pumpkins, kaffir corn, manna and kaffir monkey nuts were grown. Oats and wheat, usually only in small patches, were grown as winter crops under irrigation. Tobacco was gradually becoming established as the main crop of the sandy soils. The idea of growing crops for home feeding of stock was strange to Rhodesian farmers, and enlisted but very few supporters. The experimental efforts of the past three seasons have consequently been largely spade-work. The first essential was to extend the range of summer crops, and so to provide for greater variety of cropping and consequent rotation of crops. In addition to introducing new crops and ascertaining the most suitable varieties of these, dates and methods of seeding and methods of cultivation had also to be investigated. To dogmatise from results obtained over one or two seasons would be unwise, but it is now felt that sufficient information has been gathered on these points to permit of much useful advice being offered regarding many of the recently introduced rotation crops, and also in respect of many of the problems affecting soil management. Further, a foundation has been reached when plant breeding by means of selection, in order to secure hardier and heavier yielding strains of acclimatised seed, is rendered possible. Many entirely new or hitherto little known crops, among which may be mentioned summer wheat, summer oats, velvet beans, cowpeas, teff grass,



Egyptian clover, mangels, improved varieties of monkey nuts, cattle melons and sweet potatoes, have been introduced to farming notice, and are for the most part becoming recognised as staple crops, while the acreages planted to better known crops, such as manna as a summer crop, and potatoes, onions and winter cereals grown on moisture-retaining soils, and without irrigation, are annually increasing. In the experimental work many negative results have been obtained, and many crops and varieties being found unsuitable have been discarded. It must always be borne in mind, however, that negative results are of equal and sometimes even greater value than affirmative ones.

SOIL FERTILITY.—This question is receiving greater attention than heretofore. Many farmers are endeavouring to put into practice some scheme of crop rotation, and this becomes more feasible as year by year the suitability to local conditions is demonstrated of crops other than maize and tobacco. With several crops, however, for which a good market exists, and which would be of special benefit in a scheme of rotation, the difficulty of obtaining adequate machinery for planting, reaping and shelling, and the high cost of such machinery, is proving a hindrance to extended cultivation. As instances, beans, peas, cowpeas and ground nuts may be mentioned. With these crops the labour entailed in reaping and shelling by hand is so great that but small profit frequently remains when the product is placed on the market. The use of artificial fertilisers has been stimulated by the very successful manurial experiments with maize conducted on the Gwebi Experiment Farm in co-operation with the Chemist. To draw too definite conclusions from the result of one year's experiments only would be unwise, but the fact that by the use of a complete dressing of artificial manure which makes for maintenance of soil fertility, the yield per acre was practically doubled (approximately 6½ bags to 12 bags per acre), and this, moreover, at a profit of about 13s. per acre, has thrown some light upon what may be done by means of high farming. This information is of considerable importance in dealing with the question of the profitable working of smaller holdings. The sale of artificial fertilisers has during the past year largely exceeded that of any previous year, and this not to tobacco growers only, but also to grain and mixed farmers.



THE BOTANICAL EXPERIMENT STATION, SALISBURY.—In spite of the very scanty rainfall, the experimental work on this station was attended with considerable success, and comparatively few failures owing to drought have to be recorded. Two hundred and thirty different crops or varieties of crop were under trial, but space will not permit of all the experiments being dealt with at length, and reference will, therefore, only be made to the more important and successful results, though it must be remembered that negative results are often valuable, in that they may save the farmer considerable financial loss. Except where expressly stated, no manures were applied to any of the crops, and all were grown under field conditions.

*Wheat and Oats.*—The great problem in connection with the growing of these crops is the prevalence of rust, and the attempt to solve this by the creation of hybrids has yielded promising results. Fifteen cross-bred strains of wheat, of which in most cases Victoria was one of the parents, were grown as summer crops, and were resistant to rust and yielded well. Large plots of these are being sown again this season, and the most promising will also be sown in field trials on the Gwebi Experiment Farm. The grain of the hybrids shews a great improvement in quality as compared with that of Victoria wheat, and several strains promise greater rust resistance. Victoria wheat grown for the third year in succession on the sand land without the addition of manure maintained its reputation for freedom from rust, though the yield was adversely affected by drought during the flowering and ripening period. These results were confirmed on a field of 10 acres on the Gwebi Experiment Farm. Locally-grown seed shewed equal immunity with imported seed, though this was not the case with Early Gluyas wheat grown on adjoining plots. The latter variety, however, proved a better drought-resister. Several varieties of Durum wheat, including Medeah, Belaturka and Zwartbaard, failed entirely owing to rust. Among the new varieties introduced, two, namely, Yellow Cross and Bishop wheat, stand out prominently, on account of their quick maturity and resistance to rust. All yields were adversely affected by drought. Victoria wheat, referred to above, gave 2 bags per acre. Yellow Cross  $3\frac{1}{4}$  bags, Bishop  $2\frac{1}{2}$  bags, Gluyas 3 bags per acre. In explanation of the small returns, it must be pointed out that the wheats are primarily tested for hardiness and resistance to rust, and



thus far have been grown under as trying conditions as possible, such as poor soil and the presence, in their immediate vicinity, of varieties highly susceptible to rust. In all 52 different strains of wheat were under trial.

*Oats.*—Fifteen varieties were tested, and of the better known the Algerian oat is deserving of mention, owing to its rust resistance. This has now been proved a suitable summer crop, but rather too slow to mature. Varieties quicker to mature but not quite so resistant to rust are Sidonian, Garton's New Zealand and White Tartarian. The introduction of three Canadian strains, namely, Sixty Day, Early Ripe and Daubenny, met with great success, yielding forage of the highest quality. Barleys and rye also received attention. Chevalier barley failed owing to rust, and rye apparently from drought; but Nepal—a good feed barley—yielded  $3\frac{1}{2}$  bags of grain per acre. It is not too much to say that the results of experiments having for their object the introduction of varieties of wheat, oats and barley suitable for sowing during the rainy season are highly encouraging.

*Oil Seeds.*—Successful crops of ground nuts, linseed and sunflower were grown, and experiments conducted with castor oil, Sesame (*Sesamum indicum*) and *Guizotia oleifera*, which all shew some promise. Five varieties of ground nuts were grown in comparative trials. The greater cropping powers of newly introduced varieties, together with the improved size and quality of the nuts, are of the greatest importance, when it is remembered that there is an almost unlimited demand for ground nuts, at a price ranging from 8s. to 13s. per bag of 80 lbs., and that local supplies have never within recent years been equal to the demand.

*Bean Crops.*—Twenty-nine varieties of Soya bean were also grown in comparative trials, but results were extremely poor. The Southern and Sakura were the most promising, but even with these the yield of seed was very light, and at the present market value of about 5s. per 100 lbs. the crop does not appear worthy of attention in Rhodesia. From the point of view of a feed, velvet beans afford a heavier yield of fodder per acre, while cowpeas give a better yield of grain. Further trials on a small scale are, however, being made with locally grown and acclimatised seed of the more promising strains.



*Root Crops.*—All root crops suffered considerably from drought. Yellow Globe and Mammoth Long Red Mangel, Klein Wanzleben and Vilmorin's Improved Sugar Beet and Giant White Belgian Carrot were grown. The latter crop did remarkably well, and gave a good yield of nice, sound roots. Turnips, swedes, kohl-rabi, rape and thousand-head kale all suffered severely from the attack of saw-fly, but kohl-rabi, in spite of this, gave a fair crop both here and on the Gwebi Experiment Farm. Turnips and swedes are not to be recommended as farm crops for most parts of Southern Rhodesia, since, owing to insect attack, they are too uncertain.

*Potatoes.*—Variety trials with eleven kinds of potatoes were grown on red soil, with no other manurial dressing than 50 lbs. double complete Safco per acre applied in the drills. The experiment was intended both as a variety trial and to ascertain the relative resistance of the different varieties to early blight (*Macrosperium solani*). Factor gave the heaviest yield, closely followed by Up-to-Date, and these two proved the most resistant to disease. Heavier crops would doubtless have been secured had the land been dressed with kraal manure.

*Clovers.*—The following clovers have been tested on the Botanical Experiment Station during the past three years:—Egyptian clover or Berseem, Bokhara clover, red clover, crimson clover, white clover, alsyke and cowgrass clover. With the exception of the two first-named, all have proved useless, and have therefore been discarded. Egyptian clover, on the other hand, seems likely to prove a most valuable annual hay crop. Four varieties, Kadrawi, Miscawi, Saidi and Fahl, were introduced direct from Egypt, and were tested against the Berseem stocked by European seed merchants. Both Miscawi and Kadrawi proved superior, the former giving a yield of 1½ tons of cured hay per acre, which was followed by a good aftermath. The first cutting was obtained exactly three months from the date of sowing, and the growth was far more robust than that of dryland lucerne on an adjoining plot. When these results are considered in the light of an extremely droughty year and on rather a dry soil, and are confirmed by similar results in the two previous years, Egyptian clover will be seen to be a most valuable crop. Under favourable conditions it will



probably yield two cuttings for hay and a good aftermath, and on land under irrigation where lucerne has failed Egyptian clover should certainly be given a trial.

*Beggar Weed (Desmodium tortuosum).*—This is giving valuable results as a dryland crop, and appears better suited to local conditions than lucerne. It is now in its second year, and gave three cuttings for hay last season, while the aftermath remained green until the end of August. The hay is well liked by cattle, and the crop was grazed with avidity by sheep.

MISCELLANEOUS CROPS.—A successful crop of buckwheat (black hulled) was grown. The yield was 1,340 lbs. of seed per acre.

*Napier's Fodder (Pennisetum purpureum)* and *Sugar Cane (Saccharum officinarum).*—These crops continue to give good results for soiling or ensilage, and remained green well into July, in spite of severe frosts at ground level. The best results are obtained if the plants are cut continually after reaching a height of about 3 to 4 feet.

*Lucerne (Medicago sativa).*—The dryland lucerne is rapidly dying out, apparently owing to several causes, the chief of which is the stem eelworm (*Tylenchus devastatrix*). Measures are being taken to stamp out the disease. Dryland lucerne in Rhodesia does not, however, give any promise of proving a permanent success.

*Winter Pasture Plants and Grasses.*—The drought has been too severe for any of these, and the plants have afforded no grazing since July. No re-growth was made even by *paspalum* until the commencement of the heavy rains in December. *Burnet (Sanguisorba minor)*, *cocksfoot (Dactylis glomerata)*, *tall fescue (Festuca elatior)*, *awnless brome grass (Bromus inermis)*, have practically died out, and *Phalaris bulbosa* also to a great extent. *Paspalum* alone retains its command of the land. It must be admitted that on these dry red soils the problem of winter pasture grasses still remains unsolved, though *Paspalum dilatatum* is undoubtedly the most satisfactory. As has been pointed out in previous reports, all the grasses will probably do much better on the cooler and more moist sand soils of Rhodesia.



**GWEBI EXPERIMENT FARM.**—Three hundred and fifty acres were under crop, but for reasons of space only the more important experiments will be here dealt with. The rainfall at this station was comparatively favourable. All work on the farm was seriously handicapped during the planting season, owing to lack of labour. For this reason cultivation of the maize crop was necessarily neglected during the early stages of growth, and seeding of secondary crops was in many cases delayed unduly. In spite of these drawbacks, however, much information of great value has been obtained during the year.

*Maize.*—Salisbury White (maize 1910, wheat and oats 1911) returned an average yield of 8 bags per acre without manure. On 2 acres of the same land where the 1910 crop had been linseed, the maize plants were less robust in growth, less healthy in appearance, and the yield per acre fell to 3 bags. This fact is noteworthy as indicative of the exhausting effect of linseed on soils of only moderate fertility, and leads to the conclusion that linseed should either be grown on the more fertile soils or that the succeeding crops should receive a generous dressing of manure.

*Cattle Melons.*—A small plot of m'jorta melons was grown, planted in hills 12 by 12 feet apart. The hills were lightly dressed with kraal manure. The yield per acre was at the rate of 24 tons. These cattle melons kept excellently, were well liked by the stock, and were not fed until August and September, after the mangels had all been used. The sequence of feeding of succulent crops was as follows:—Kohl-rabi, mangels, melons, and last of all maize silage.

*Summer Wheat.*—Ten acres were sown to Victoria wheat on the poorest red soil on the farm which the previous year had only produced 3 bags of maize per acre. The crop was free from rust but short in the straw, and except on the ant-heaps the ears were small and light.

Other crops grown on the farm were oats, winter wheat, velyet beans, kaffir beans, teff grass, Boer manna, rye, monkey nuts and Soya beans.

The revenue derived from the sale of selected seed maize, teff grass, linseed, etc., grown on the farm amounted to £112. The weight of selected seed maize sold to farmers totalled

9,500 lbs., and this amount was distributed between forty-six individuals. In addition, maize grown on the farm, and valued at £130, was supplied for the maintenance of boys and animals on the Botanical Experiment Station and the Forestry Station. The natural increase in cattle and sheep remains satisfactory, and there has been remarkably little sickness or loss amongst the stock.

LONGILA EXPERIMENT FARM, MATABELELAND.—This farm, which consists of 3,500 acres of undulating granite sand soil of but indifferent fertility, is situated  $2\frac{1}{2}$  miles from Lochard Siding, and abuts on the railway line. The situation is very exposed, and the farm is practically bare of timber, but possesses a good supply of permanent water in pools, while in the vleis are to be found moderate acreages of naturally moist soil, on which it is intended to experiment with winter crops without irrigation. Farming operations were commenced on 14th January. The season has been a most unpropitious one in which to initiate experimental work, only 6 inches of rain having been recorded between the months of February and December. As a result of the short rainfall, the ground remained so hard that it was impossible to carry out any extensive ploughing except in the vleis. Forest trees of suitable varieties, to the number of several thousand, have been raised, in order to provide shelter belts, and a wind screen of silver wattle has already been established around the site of the homestead.

No breeding stock, with the exception of a small flock of cross-bred Merino-Persian sheep, have yet been placed on the farm. The draught animals comprise 8 mules and 16 oxen. A dipping tank and good water supply have been provided, and a small tobacco-curing barn and packing shed are in course of erection, but the other buildings are as yet of a temporary nature only.

The Longila Experiment Farm is typical of the poorer and dryer sand veld farms of Southern Rhodesia, but it is believed that this class of country, given adequate knowledge of its requirements and capabilities, will lend itself to improvement and profitable farming, and it is with the object of proving this that the station has been established.



CO-OPERATIVE EXPERIMENTS.—Under this system parcels of seed of those crops which have already given promising results on the Government experiment farms have been distributed to farmers for trial on their own farms. The unfavourable opening of the season led to a reduction in the number of experiments conducted with summer crops, and, owing to the short rainfall, many of the vleis soils were insufficiently moist to carry winter crops. During the summer distribution, 140 farmers received free issues, calling for the despatch of 430 packages of seed. In all, just under two tons of seed was distributed in this manner.

The distribution of winter cereal seeds for trial under irrigation or on naturally damp soil was taken advantage of by 64 farmers, to whom  $2\frac{1}{4}$  tons of seed was issued in 305 packages. The following varieties were under trial:—Oats: Algerian, Sidonian, Garton's New Zealand, Texas, Greyside, Danish, Smyrna, Appler (weight 1,225 lbs.). Wheats: Bobs, Gluyas, Durum, Zwartbaard, Medeah, Klein Koren and Golden Ball (weight 2,256 lbs.). Barleys: Swedish and English, Chevalier and Nepal barley (weight 540 lbs.). Rye: Early and late Mammoth (weight 380 lbs.). In addition to the issues outlined above, considerable quantities of all seeds were sent from the seed store to the experiment farms at Gwebi and Lochard. Interest in co-operative experiments has again revived this year, and, at the time of writing, applications for seed from 200 farmers have already been received.

EXPERIMENTS WITH COTTON.—With the aid of funds provided by the Land Settlement Department, the cotton experiments in the Hartley district are being renewed this season on Mr. Cutler's farm. Cotton promises fairly well in this district, but the question of labour is the main difficulty. The quality of the cotton which can be grown has already been proved to be excellent.

PASPALUM (*Paspalum dilatatum*).—Much difference of opinion exists as to the value of paspalum as a winter pasture grass, and many conflicting statements are abroad. In parts of Australia it is repeatedly stated that Rhodes grass is quite valueless for winter grazing, and on the dryer soils paspalum is proving superior either to tall fescue or *Phalaris bulbosa*. While it is true that in dry situations paspalum does not remain green throughout the entire winter months, it yet holds

its own against veld grasses and weeds, and affords good autumn and early spring feed. In time, other and better grasses may be forthcoming, but for the present *paspalum* holds first place, and the many arguments used against it do not hold good on our large Rhodesian farms, since it is undoubtedly superior to the majority of the indigenous grasses, and 50 to 100 acres may well be laid down to *paspalum*, thereby greatly increasing the stock-carrying capacity of the farm without encroaching on land which might be put to better use.

The drought of the past year has afforded much interesting information regarding afforestation work in Southern Rhodesia. In Bulawayo and Salisbury the mortality among many of the species planted some years ago has been very great, and not only in private gardens but also in the municipal parks large numbers of trees have succumbed. Among the timber trees which have suffered most may be mentioned *Cupressus macrocarpa*, *Pinus insignis* and *Pinus pinaster* severely, and *Eucalyptus citriodora* slightly. The following trees continue to thrive well throughout the country generally, have not suffered seriously from the drought, and may now be regarded among those best suited to local conditions:—

|                           |     |     |  |
|---------------------------|-----|-----|--|
| Saligna gum               | ... | ... | <i>Eucalyptus saligna</i>  |
| Swamp mahogany gum        | ... | ,,  | <i>robusta</i>   |
| Rostrata gum, narrow leaf | ... | ,,  | <i>rostrata</i>  |
| ,,   ,,   broad leaf      | ... | ,,  | ,,   |
| Lemon-scented gum         | ... | ,,  | <i>citriodora</i>  |
| Indian toona              | ... | ... | <i>Cedrela toona</i>   |
| Common cypress            | ... | ... | <i>Cupressus sempervirens</i> ,<br>vars. <i>pyramidalis</i> and<br><i>horizontalis</i> |
| Arizona cypress           | ... | ... | <i>Cupressus arizonica</i>   |
| Guadaloupe cypress        | ... | ,,  | <i>guadaloupensis</i>  |
| Beefwood                  | ... | ... | <i>Casuarina leptoclada</i>  |
| Aleppo pine               | ... | ... | <i>Pinus halepensis</i>  |
| Cheer pine                | ... | ,,  | <i>longifolia</i>  |
| Indian sissoo             | ... | ... | <i>Dalbergia sissoo</i>  |
| —                         | ... | ... | <i>Callitris robusta</i>   |
| —                         | ... | ,,  | <i>calcarata</i>   |
| Arbor-vitæ                | ... | ... | <i>Thuja</i> spp.  |



In September the old Forest Nursery,  $2\frac{1}{2}$  miles from Salisbury, on the Enterprise road, was re-opened, and the work of raising seedling trees and restoring the plantations to something approaching order was commenced, though the latter, after so long a period of neglect, cannot be completed in one year. Fifteen thousand seedling trees were raised and transplanted into trays at the Botanical Experiment Station, and 30,000 have been grown and tinned at the Forest Nursery.

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## The Tuberculosis Enquiry.

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The British Royal Commission on Tuberculosis, which has been sitting for nearly twelve years, has now issued its final report. The Commission was appointed after a declaration in 1901 by Dr. Koch that "human tuberculosis differs from bovine, and cannot be transferred to cattle"—a statement which, if proved, had an obvious bearing upon legislation calculated to prevent the spread of the disease.

The Commissioners dealt with this and the other points referred to them. In a first interim report, dated June, 1904, they found that tubercle of human origin can give rise in the bovine animal to tuberculosis identical with ordinary bovine tuberculosis. In a second interim report of February, 1907, they state that cows' milk containing bovine tubercle is clearly a cause of tuberculosis and of fatal tuberculosis in man. In the final report now issued, the Commissioners recommend drastic action to prevent meat and milk affecting human beings, the isolation of highly infectious cases, better housing and special separate treatment for children, and the appointment of an advisory council to assist the Government.—(*Journal of Agriculture*, Victoria, 10th June, 1913.)

# Notes on Agricultural Co-operation.

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By Mrs. D. O. MALCOLM.

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The preliminary step towards establishing agricultural co-operation in a district for the first time, whether for the purpose of buying or selling, should be to bring together the farmers of the district and explain the advantages of that special form of co-operation, and the workings of the system with suitable business methods.

In Ireland, the pioneer of agricultural co-operation in the English-speaking countries, this educational work has been undertaken by the Irish Agricultural Organisation Society. The Society does not trade in any way, but it teaches the farmers to combine for mutual protection, and to do the work of the combination in a business-like manner. It is absolutely necessary for the success of any agricultural co-operative society that it should have—

- (a) a code of rules which ensures fair play all round;
- (b) sufficient trading capital;
- (c) a capable and trustworthy committee and secretary;
- (d) the strictest honesty, punctuality and loyalty amongst its members, with a clear understanding of the meaning of co-operation, which is self-help by mutual help.

The constitution of co-operative agricultural societies is essentially democratic, every member having an equal share in the election of a committee of management. The purposes of such a society may be two-fold. It may purchase farm implements, machinery, chemical manures, foodstuffs, seeds, or any other agricultural requirements in large quantities and



at wholesale prices from the manufacturer, thereby enabling the members to get what they want at the cheapest rate and of the best quality, and it may also collect, grade, pack, and dispose of the members' farm produce at a uniformly higher rate by raising and fixing the standard of quality, eliminating the middlemen, and finding the best possible market. The necessary capital to carry on the business is provided by the members, who subscribe shares. The value of such shares is usually £1 each, which need not be paid in at once, but 5s. should be paid as a first instalment, and the balance in such calls as may be found necessary from time to time; a fortnight's notice to be given beforehand. There is also an entrance fee, which may vary according to the number of acres farmed. In Ireland the Co-operative Agency Society is a selling federation, and the Agricultural Wholesale Society is a wholesale purchaser, but in Rhodesia the same societies would probably combine both branches of the work with advantage, thereby economising money and labour. When this is done, it would be necessary to double the share capital, as the liabilities would also be duplicated; the liability of the members to be limited to the amount of their shares. Further capital might be acquired by borrowing from a local land bank, and sometimes people who are not themselves farmers are willing to invest money in a co-operative society. The commission on purchases and sales forms a regular fund, which increases as business grows. For example, in the French Co-operative Syndicates the commission is usually one or two per cent., or on some articles four per cent. is charged owing to the size or distance. This commission money is generally used solely for the purpose of general expenses.

In forming societies it has always been found inadvisable that they should cover a very wide area. Closer proximity is much more favourable for creating a bond of union amongst members, besides lessening the difficulties of transport, but when a certain number of societies have been formed they should be federated into a Union. The exact methods employed for collecting, grading, packing and selling the members' produce must depend upon the kind of produce, locality, means of transport, etc., and these details should be threshed out and settled on sound business lines at a general meeting of the members, assisted by the Agricultural Department if required.

In addition to taking shares, members are generally required to enter into a legal undertaking to sell all their marketable eggs, poultry, milk, tobacco, fruit or vegetables, etc., as the case may be, through the society, except what they require for their home consumption. The whole profits which are realised on the sale of produce become the property of the members in proportion to the value supplied by each, first setting aside sufficient to pay interest on the shares at the rate of 5 per cent. per annum. In the case of poultry, the society has various methods of helping the farmers to attain to a better standard of eggs and poultry, and in consequence they ensure higher prices and a regular market. Members are advised as to the best breed of hens, both for egg-laying and for fattening purposes. Foodstuffs are obtained at wholesale prices, and by buying members' eggs by *weight*, instead of at so much a dozen, the intelligent and go-ahead poultry keeper is awarded for his enterprise. The eggs must arrive at the depôt in a perfectly fresh and clean condition, after which they are carefully graded according to size and properly packed. When a good reputation for first-class eggs has been established, it is a good plan for the society to institute a brand for their eggs by which they may be known and asked for. This plan has been adopted by the English National Poultry Organisation Society with great success.

For the tobacco grower a co-operative society has many advantages. For example:—

- (a) it procures the best seed, fertilisers, etc., at wholesale prices;
- (b) it owns its own warehouse for collecting, grading and selling the tobacco; after deducting a small commission for running expenses, the profits are all divided among the members in proportion to the amount of produce supplied by each, first setting aside sufficient to pay 5 per cent. interest on the shares;
- (c) the society may establish an experimental plot of ground upon which tobacco-growing experiments may be tried, under the supervision and instruction of experts from the Department of Agriculture.



The successful possibilities of a creamery run on co-operative lines have recently been admirably demonstrated at Gwelo.

By means of co-operative societies for the collective purchasing of farm implements and machinery, chemical manures, foodstuffs, seeds, etc., large quantities can be purchased at wholesale prices and sold to the members, and arrangements may also be made for their carriage by railway at lower rates. Large and expensive machines may be bought singly and let out to members at a small charge, the temporary owner being responsible for its safety, and for passing it on by a given date to the next hirer. If additional money is required to purchase such a machine, the sum may be raised by a general *pro rata* subscription by members of the society, according to the acreage of their farms, repayment to be made by a similar *pro rata* scale of rent for the use. A small association might raise money by borrowing the sum required on the joint security of its members, buying the machine, and calculating the rent charged for its use which will pay the interest and repay the loan. It is inadvisable to lend machines free of charge, except for a short period for the purpose of making them known. In order to persuade very conservative farmers who are averse to new methods, prizes of a proportion of their cost might be offered for the greatest skill in the use of the new machines.

For the purchase of chemical manures, foodstuffs, seeds, etc., members should send in their orders twice a year to the central dépôt. With a knowledge of approximately what quantities will be required, the secretary can ask for tenders from different merchants, and obtain lower prices for a large order. Members should pay cash, or a certain date should be fixed for payment, after which defaulters would be struck off the list of membership.

The Irish Agricultural Wholesale Society has extended collective purchasing to other articles—notably groceries—the object being to free the farmers from the grip of the Gombeen man; but this has never been done in France, where the co-operative societies wished to avoid any conflict with local trade, and so kept their business within purely agricultural limits. The principle of collective purchasing could be extended in Rhodesia by individual societies, as the members themselves saw fit.

In the case of co-operative cattle insurance societies, there are evidently certain factors to be reckoned with in Rhodesia, which make comparison with other countries difficult; for example, the great distances, want of practising veterinary surgeons in small districts, and low mortality from ordinary causes combined with the possibility (happily decreasing rapidly) of heavy losses from contagious outbreaks. But although the systems of cattle insurance in Ireland and on the Continent are framed primarily for peasant proprietors, owning only a few head of cattle, and living comparatively close together, thereby reducing the cost of inspection and treatment, a few notes on their methods may be of interest to Rhodesian readers.

In a co-operative insurance society there need be no outside expenses, the work being done by the members. The profits belong to the members themselves, and are used to lessen the money paid per cow and to increase the sums paid in case of loss, or to start more co-operation as the farmers themselves may decide. Members pay a small entrance fee; they then elect a committee, and the committee elects a president and secretary. It is advisable that the secretary should be paid. The area covered by farms of insured members is divided into districts, and two valuers elected for each district. The valuers must be insured members, and should be paid for their services. Their work will be to examine into the health and condition of the animals of those who apply for insurance, and to repeat this twice yearly so as to note changes in value during the year. When a farmer applies for insurance he must declare all the animals he possesses, and those that he does not propose to insure must be examined by the valuers, so as to make certain that there is no disease on the farm. There should be a minimum and maximum age limit for cattle insured. The reports of the valuers, with notes of the age, sex, breed, marks and value of all animals offered for insurance, to be sent in to the secretary, who will enter them in the register, the value to be assessed by the owner and two elected valuers. Should the three estimates differ, they are to be added together, the total divided by three, and the result to stand as the valuation. When illness or accident occurs, the owner must at once notify it to the two nearest valuers, who shall inspect the animal and advise and assist, also advise whether a veterinary



surgeon should be called in, and in consultation with the "vet" may decide that the animal should be slaughtered. They then value the animal at what its market value would be if it were in good health, and on that valuation the indemnity is paid if there is a loss. The value for indemnity must not be more than 10 per cent. higher than the original value at which the animal was insured. Two-thirds of the value decided on is paid to the owner, and is called the indemnity, the owner bearing the loss of the other third. This is a necessary safeguard against neglect, bad treatment and fraud. The owner must give the carcase to be disposed of by the committee in the interests of the society, and the committee must appoint a man competent to deal with it, so as to recover the utmost value. Timely compulsory slaughter while the animal is fit for food is often less disastrous than a long illness, loss of condition, stoppage of milk, fees of the veterinary surgeon, and the cost of medicine. If an insured animal is sold to an insured fellow-member it remains insured, but if an insured animal is sold to a person not insured, the insurance drops. If an insured animal is parted with and another animal replaces it, the new one is covered by the insurance of the old animal, but notice of the change must be given to the secretary, in order that the new animal should be examined and valued and the difference in value noted.

Societies may retain a veterinary surgeon at an annual fee, so that his services may be given cheaply to members. When an accident or long illness occurs, a "vet" is called in by the valuers. The society pays half the "vet's" fee if the animal dies or is killed, but if it recovers the owner pays the fee. It has been calculated by the Irish Agricultural Organisation Society, from the experience of several European countries, that, given careful examination and inspection, the percentage of deaths for individual local societies would range from one to three per cent., and sometimes four per cent. The premiums are calculated to cover losses up to four per cent. The Irish Agricultural Organisation Society's Insurance Society started with premiums at about one-fiftieth of the value of the animals insured; that is, about two per cent. The French Co-operative Insurance Societies also insure at a maximum of two per cent. Thus, for an animal valued at £16 the premium would be 6s. 8d. Animals are not insured for more than £16 unless

specially permitted by the committee on the ground of actual farm and dairy value, and the minimum premium is 2s. for animals worth £5. These figures will probably not be at all applicable to Rhodesia, and are only given as an example of how the insurance is worked in other countries. Experience, both in Ireland and France, has shewn that the best method is to confine the societies to relatively small areas in which the farmers would know their neighbours, and their care of their cattle, and could exercise some supervision over each other for the common welfare and safety. It is evident that no ordinary insurance companies could exercise such minute precautions, and consequently their rates must be considerably higher, to guard themselves against being victimised by the unscrupulous. But though small areas are important as a foundation, in bad times such societies could not meet their losses, so, when a certain number of societies have been registered, a federated Union of Societies should be formed. This Union undertakes to pay a half or a third of each local society's losses, receiving in return a half or a third of its premiums. This re-insurance lessens the risk of the local societies, and enables them to meet their losses, while the Union, as its risks are less from being so widely spread, can be of greater assistance to a local society that has suffered badly. As no insurance society can cope with a universal epizootic, extraordinary losses might be met with in any of the following ways:—

- (a) the society can vote to lessen the amount of the indemnity it pays;
- (b) it may vote to make an additional levy over and above the premiums;
- (c) it can vote to postpone the indemnities until better times;
- (d) it can ask the Central Union, if it has any reserve funds, to grant them a loan.

Breaches of rules, refusal to do what is ordered by the committee or its delegated officials, frauds or attempted frauds, false returns, ill-treatment, refusal of required information by the owner or those for whom he is legally responsible, and all unfair dealing, should cause forfeiture of indemnity; this refers both to members and their dealings with their society, and to societies in their dealings with the Union.



Societies which have a careful committee, a good secretary, scrupulous valuers, and members all co-operating for self-help and mutual help, will soon have a reserve fund. When a society has built up a reserve fund, applicants for membership must pay a proportionately higher entrance fee, because they cannot have for nothing the benefit of what others have paid for.

Cattle insurance not only helps the farmer over bad times, but it tends to improve the class of cattle. The farmer who is not insured fears great loss at one stroke, and buys two inferior animals (costing more to keep) instead of one good one; but if insured, he could buy one good, profitable animal, knowing he can replace it at once if lost. A land bank which lends money to buy cattle will do so more readily once a cattle insurance scheme is at work in the district, knowing that its loans are more secure in consequence.

Co-operation has had such an enormous effect on the rural life of the countries which have adopted its principles, as to appear almost magical. Denmark has become a new and prosperous country, having made practically a corner in the European butter market. In France the Co-operative Syndicates, although they have not taken up the collecting and selling of farm produce to any great extent, have proved of incalculable benefit to the French farmer by establishing land banks, schemes of cattle and other insurance, collective purchasing, etc., while in Ireland, thanks to the untiring energy and enthusiasm of Sir Horace Plunkett, Mr. George Russell, and other active workers of the Irish Agricultural Organising Society, there has been created a new spirit of hope and progress that no political dissensions can destroy. For the fruits of co-operation are not only increased material prosperity, but self-reliance, mutual assistance, sympathy, and understanding.

[These notes were originally made from a mass of literature on agricultural co-operation given me by Sir Horace Plunkett, the great Apostle of Co-operation in Ireland, together with a report on the French Co-operative Syndicates. They are not written with any practical knowledge of farming, and are only a slight attempt to extract from a mass of detail the essential principles of any co-operative association,—  
CLAIRE MALCOLM.]

## Lessons of Drought.

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By ERIC A. NOBBS, Ph.D., B.Sc.

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The drought of 1912-13 will long be remembered in Matabeleland, not only on account of the losses occasioned, but also because such an untoward event was unexpected, and consequently everyone unprepared to meet the new conditions which suddenly arose, and which continued far longer than could normally have been anticipated. Rhodesia is accustomed to its long dry winters, and the herbage and live stock, as well as people, are more or less prepared for six months or so without rain. This period, which is comparable to the frozen and snow-bound seasons of other parts of the world, was extended far into the normal growing season, and the rains, as well as being late, were deficient and unfavourably distributed. Not only was this the case, but the occurrence was repeated in two successive years. The districts lying between the Tati border and Insiza, and especially the vicinity of Bulawayo, Figtree and the Mopani veld to the south of the Matopos, all suffered severely, although within this area certain favoured localities received showers time after time, whilst adjacent farms remained without rain. Storms seemed to follow certain defined paths, and this irregular precipitation caused the drought to vary in intensity in an erratic and remarkable manner. As a consequence, in some parts the crops have been almost negligible, and stock have had to be moved away; whilst near by, as on the Samokwe River and around Nyamandhlovu, yields have been good.

Whilst those owning most cattle naturally had most to lose, it was the newcomers, of whom there are many in the localities chiefly affected, who suffered most severely. A number of settlers had only been one or two seasons on their farms,



and had not yet secured much return from crops and stock, when they had the misfortune to encounter two successive dry years, and this has naturally proved a serious set-back to them and to the country they occupy. Newcomers generally make provision for the first year or so, but expect to be getting good returns in the second year. In the parts of the country referred to, they have in this case been disappointed. It must naturally be some time now before they can get on their feet again, and the set-back has been severe, although actual ruin has not occurred. Older residents, past the initial stage of capital expenditure and with accumulated resources, were not so hard hit.

The wants of the natives have been mainly met in the south-west and west of Matabeleland by local traders, but in certain cases it was found expedient and necessary for Government to sell grain and even to distribute free rations in necessitous cases. Many of the natives are well off, however, and were quite able to pay for grain by the sale of a few head of stock. Several farmers also have seized this opportunity, and have traded grain for cattle, and those in a position to do this have profited by the drought. The deficiency of crops has also had the effect of inducing the natives to turn out to work on the farms, and thereby they benefit not only the farmers, who get labour, but also the country, by retaining in it the wages which otherwise go to aliens, who take their savings elsewhere. The civilising influence of working for farmers is also beneficial. It is noticeable that the Matabele and Makalanga are adopting European methods as the result of seeing the advantages of the plough and other implements at work, whereas natives who have not worked for European farmers still follow their primitive ways.

Although well known as healthy stock country, most of the portions of Matabeleland where drought occurred are by no means densely stocked, and the usual cattle-carrying capacity of a farm of six thousand acres, where artificial feeding is not practised, is recognised as being from 250 to 300 head. Had it been otherwise, the losses would have been heavier. The natives owning hardy local cattle in small herds do not appear to have suffered less severely than Europeans holding a large proportion of grade cattle. This is perhaps due to the fact that the white man in an emergency under-

stands better how to care for his cattle than does the improvident native. This fact also serves to dispel the ideas of those who assert that improved cattle are unsuited to the country. In the region affected the three European breeds most favoured, to the exclusion almost of all others, are the Shorthorn, Hereford and Friesland. The last-named are chiefly in the hands of dairymen, and are always artificially fed, so that they hardly come into consideration; but of the other two the general opinion seemed to be that where exposed to the rigours of the drought, the Hereford had done better, which is in keeping with general experience. Some herds possessing strong infusion of Herefords, such as that of Mr. Granger at Monaro, where the drought was very severe, had come through well, whereas Shorthorn grade herds in the vicinity suffered severely. It is clear that those who select the Shorthorn where water supplies are scarce must have ample supplies of fodder laid by for emergency.

In general, the mortality amongst cattle has been less than many supposed, the idea of wholesale losses gaining currency on account of the severe losses of a few individuals, and the fact that almost everyone over large areas did lose a few beasts. The impression that losses were heavy was augmented by the secrecy on the subject which some owners observed, and by that curious mental perversity which induces men unduly to magnify their neighbours' troubles. In some instances only the old and toothless cattle died. Elsewhere deaths were due to impoverished and weak cattle getting into mud holes or falling down steep river banks, a trouble which can largely be obviated by the provision of proper watering facilities. In some cases farms were notoriously over-stocked, and in others the owners, hoping always for rain, delayed too long in moving to fresh pasturage, so that the animals died either before they could be moved, on the way, or on arrival at their destination. A more general source of loss, however, was amongst calving cows and calves, and the bad effects of this circumstance will be observable in these herds for a long time to come. The fact of two years of drought coming together will cause a gap in the crop of calves and a diminution in the natural increase over three seasons, and in the following generation also. The total loss is, of course, heavy, and although spread over many owners must in the aggregate prove an undoubted check to the community at large.



The history of British breeds of cattle teaches us that the greatest improvement in size, quality, and early maturity synchronised with the introduction of winter feeding, and more particularly with the cultivation of roots.

Although it is too much to say that the drought was a blessing in disguise, even a specially effective disguise, yet it may be claimed that it was not entirely without its compensations. Those who suffered would no doubt have willingly dispensed with both drought and compensations alike, but having been obliged to submit to the drought, let us now seek those redeeming features, and if possible benefit therefrom.

The outstanding lesson is the necessity of providing water and food for cattle in the winter, and a surplus against the occurrence of any unusual drought. The seasonal impoverishment of stock, especially of cows in calf, is to be avoided mainly on account of the much greater quantity of feed and time required to add a pound of flesh to an animal in low condition compared to what is required to do the same to a beast in good order. Stock brought well through the winter are able to benefit to the fullest extent in the summer when there is generally a superabundance of food for a few months.

The impression has been borne in upon many that water is a more important item than food. This is because it is usually the rarer of the two commodities, and also because in the dry and cold season stock are least able to travel far between their grazing and their water, and are inclined to stay near the latter, even if the veld is not so good as that further away. The conclusions to be drawn are that the veld to be preserved for winter use is that nearest to the water (although the converse is the more common practice), and that water should be furnished not only in one place on the farm, as is so often the case, but in as many different parts as possible, in order to minimise the daily walk to water. As a rough guide, it may be taken that drinking places should be situated not more than four miles apart on ranches, so that stock need not go more than two miles to drink; but a less distance is even better.

Farming operations being largely suspended during the drought, many farmers have been devoting their energies, perhaps somewhat tardily, to sinking wells, in the hope of

obtaining underground water at convenient points. Desirable situation and convenience to the kitchen, rather than any judicious examination of the water-bearing conditions of the sub-soil and rock, seems too often to have been the main consideration in the selection of a site for wells, whilst faith in mechanical devices and superstitious beliefs have also played a not unimportant role in the choice. Hardly anywhere is underground water a certainty; in some situations water is highly likely to be found; elsewhere its location is very problematical; but generally there is a certain element of chance in finding water, although skilled and experienced geologists and engineers can minimise this risk.

Whether river, water-hole, dam, well, or bore be the source of supply, it is always desirable to water stock in troughs, and not to let them enter and foul the water they drink. The usual practice is one of the main sources of disease amongst stock, and is especially objectionable on dairy farms, besides being wasteful of the water. Too frequently on farms to-day the water is polluted and rendered unfit to drink and is wasted, springs are often closed up and trodden out, whilst emaciated and weak cattle fall into the watering places and are drowned. The ideal way to provide water is to fence off the supply, and to pass it into troughs of ample length to prevent crowding, and either by ball-cock or by hand to fill the troughs afresh on each occasion.

In travelling through Matabeleland, it is noticeable how general the practice has of late become of mowing an acreage of veld for hay, baling it, not necessarily for sale, but just for use on the farm, ensuring thus a supply of fodder much superior to the dry grass left standing on the veld, and not so liable to be destroyed by grass fires. The stalks of ripe maize and kafir corn, after the grain has been harvested, are now everywhere cut and stacked, thus preserving the nutritive value more effectively than if simply left to dry out standing on the land. Such rough hay is also more palatable than dry grass or mealie stalks, and is greatly relished by cattle. Moreover, the land is immediately cleared after harvest and ploughed early, thereby benefiting the soil for the next crop, as well as destroying insect pests, and leaving no shelter for them. The advantages of this way of handling mealie stalks are very obvious, and wherever known and appreciated, it is being



adopted as part of the regular farm practice. Besides hay of the above nature, the cultivation of manna, oats, rye, velvet beans, and the like for fodder is increasing, and, given good seasons, greatly increased acreages under such fodder crops may be looked for. Every shred of forage, natural and artificial, is being preserved, a proceeding, now that the advantages have been so clearly demonstrated, likely to be repeated every year, good or bad. Parts of Rhodesia more favoured hitherto as regards rainfall may well follow the example of less fortunate portions of the country and adopt measures which cannot but be recognised to be of great benefit in any and every season.

The advantages of fences have become very apparent during the drought, enabling the utmost and best use to be made of the veld, but the drought has absorbed so much ready money that for the time being fencing is not being actively taken up, although there is no doubt that as time goes on this practice will more and more be adopted.

Four years ago ensilage, if known, was but very rarely made anywhere in Matabeleland. To-day it may be said that there are few, if any, farms throughout the region of drought without a silo. This transformation is attributable directly to the drought. Maize and other crops, failing for lack of rains, have been preserved in succulent form for winter feed. Crops sown too late to mature have been similarly dealt with. Some farmers, such as Mr. R. A. Fletcher, at Umvutcha, have constructed brick silos, lined with cement plaster, but for the most part a simple pit has sufficed. In some cases stack silos were built, but this wasteful though easy method is not proving so satisfactory as pits, which are now being generally adopted. It is not likely that the practice, now so general, will be abandoned, for in good seasons the necessary quantity of silage can be produced on a few acres, and its value has been thoroughly tested and demonstrated. When the first sowing, and often the second sowing, of mealies failed, many farmers had resort to a quick-growing variety for the purpose of obtaining at least a supply of mealie stalk hay, or silage, if not grain, and for this purpose the white and the yellow Congo varieties were largely employed. Excellent as these sorts are for their purpose, it is to be hoped that, except for this especial use,

they may not come to be extensively sown, particularly the yellow variety, which by cross-fertilisation is likely to prejudicially affect our reputation for the production of the highest class of white maize; a matter of the utmost importance if export to European markets of our surplus is to be renewed—a by no means improbable contingency. Production is increasing by leaps and bounds, and it is questionable whether local consumption can absorb with equal rapidity the large quantities of maize which, given normal seasons, will be produced during the next few years.

The majorda, the native melon, of which there are many varieties, seems to revel in dry seasons. These are now found everywhere, and no doubt will be always grown in future by those who have learnt to appreciate their good qualities. The majorda, although responsive to good soils and manuring, yet seems to thrive on comparatively poorer ground and to yield much heavier crops per acre than do pumpkins, although pound for pound it is less nourishing and perhaps less palatable than the latter. It is, however, very succulent, and for this reason invaluable when all the natural pasture is dry. It also keeps better than does the pumpkin, having a hard, smooth, shiny skin, and is solid and not hollow at the heart. The indigestibility of the seed is a drawback, as it is apt, in consequence, to become scattered as a weed over manured lands. In order to have majordas very late in the season, farmers are adopting the native custom of cutting it in slices about an inch in thickness or less and hanging it on thorns, or laying it out on corrugated iron roofs, to dry, in which condition it can be stored for a long time. If soaked in water it soon resumes its succulent character, and makes a good juicy food again.

The drought-resistant capabilities of the deep sand in granite districts is well demonstrated by the way in which fruit trees have withstood these trying seasons. This is particularly true of citrus orchards established three or four years ago without irrigation. The roots have penetrated deeply, and on that account the trees have stood the long dry seasons as they could not have endured them in a shallow or hard soil, or where surface rooting is encouraged by temporary irrigation, leaving the trees to suffer quickly when the water supply fails. Examples of such citrus groves, flourishing in adverse seasons,



are those on the farms Magot, Monaro, Maritzburg, Stonehills, Tjankwe, and Aberdour, all in parts of the country where the rainfall has been particularly deficient.

Anyone who has had occasion to traverse the drought-stricken portions of Matabeleland must have observed with admiration the excellent spirit displayed on all sides, the courage with which menace of disaster has been met, and the determination to do the best possible under adverse conditions, and even to profit by untoward circumstances. This attitude is justified by the well-known marvellous recuperative powers of the veld, and there is every reason to be assured that on the return of favourable rains, now daily to be looked for, those portions of the Territory which have suffered from drought will rapidly recover, and enable farmers soon to reduce or remove that burden of debt which has of late been unavoidably accumulating around them.

The commendable practices alluded to above, which have been learnt during these trying times, will remain as a heritage and as benefits in perpetuity, soon forming the only visible memorials of the drought, and another example of the truth of the old saying, "Sweet are the uses of adversity."

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## Spray Pumps, Insecticides, Fertilisers and Bee Hives.

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We have received from Mr. H. F. Bengler, of 30, Loveday Street, Johannesburg, three new catalogues of goods stocked by him, and in which lines he guarantees to give satisfaction to his Rhodesian customers. The catalogues consist of three sections. Section A deals with spray pumps and whitewashing machines and accessories. Section B lists insecticides, fungicides, fumigating requisites, farm chemicals and fertilisers, and Section C bees, bee hives and accessories. To farmers who are considering the purchase of the articles enumerated, we recommend them to get into communication with this well-known merchant.

# Rhodesian Maize.

## THE PRINCIPAL TYPES AND THEIR POINTS.

By J. A. T. WALTERS, B.A., Assistant Agriculturist.

Maize belongs to the grass family of plants. Its nearest relative among cultivated plants is teosinte, with which it crosses readily. Owing to its great value as a fodder and grain, it has been very extensively modified and improved, and to-day the number of well-known varieties considerably exceeds two hundred. These may be grouped into types as follows:—

(1) Ordinary Maize—

(a) Dent, white or yellow.

(b) Flint, white or yellow.

(2) Sugar Corn—

Used mainly for eating as green mealies, for which purpose it is superior to the ordinary varieties.

(3) Pop Corn—

So called because it pops or bursts when baked.

Used in the manufacture of confectionery.

(4) Flour Corn—

Very soft, and particularly subject to weevil.

The type mainly cultivated in Rhodesia is the "White Dent," known commercially as "flat white." Of this type two varieties are grown to the exclusion practically of all others, and these have attained such a point of perfection as to be equal, if not superior, to any other flat white in the world. These varieties are Hickory King, and the hybrid derived from it known as Salisbury White. This latter variety was produced in Rhodesia by farmers who endeavoured to procure a modification of the Hickory King variety in the direction of increased size of cob and total yield per acre. To achieve this end an American variety—Boone County, and a Natal variety—White Horsetooth, were used for crossing with Hickory King, and the seed was selected from those cobs which shewed a marked increase in size over Hickory King. Salis-



bury White is a modern creation, and most of the farmers who originated the variety are still alive. It still presents many of the unstable features of a hybrid. In its main features it resembles Hickory King. It differs from it by having a narrower although deeper grain; by having 12 rows; and by being greater in length and circumference. It also has a bigger core, although this does not affect very materially the relatively high weight of grain to core. This high percentage of grain to the total weight of cob is one of the best features of Hickory King, and one that is being retained as much as possible in Salisbury White by the selection for seed of *deep-grained* cobs. On the score card for maize, 20 points out of a hundred are allotted to total weight of grain as compared with the cob.

At the Umtali Show, 1912, the following figures were obtained as averages from the samples exhibited for competition:—

|                         | Weight of<br>10 cobs. | Percentage of<br>grain to cob. |
|-------------------------|-----------------------|--------------------------------|
| Hickory King—8 row ...  | 124 ozs.              | 87 per cent.                   |
|                         | 122 „                 | 87½ „                          |
|                         | 108 „                 | 89 „                           |
| Hickory King—10 row ... | 137 „                 | 86 „                           |
|                         | 122 „                 | 88 „                           |
| Salisbury White—12 row  | 152 „                 | 85½ „                          |
|                         | 150 „                 | 84½ „                          |
|                         | 138 „                 | 86 „                           |
| Boone County ... ..     | 180 „                 | 83 „                           |
|                         | 154 „                 | 83½ „                          |

At the Salisbury Show, 1913, the percentage ranged as follows:—

|                        |               |                  |
|------------------------|---------------|------------------|
| Hickory King—8 row ... | 85½ per cent. | to 87½ per cent. |
| Hickory King—10 row    | 82 „          | to 88 „          |
| Salisbury White ...    | 84 „          | to 86 „          |
| Boone County ...       | 81 „          |                  |

Full points are awarded if the percentage reaches 90 in the case of 8-row Hickory King, and even this figure has been exceeded in Rhodesia.

Salisbury White has one great advantage over Hickory King. It responds more readily to favourable conditions of soil and climate, and is consequently better adapted to the darker and richer vleis or alluvial soils, and to the more fertile

of the red and chocolate soils. On poorer soils Hickory King should be preferred. The difference may be stated by saying that on soils of medium fertility, Salisbury White will produce a big proportion of nubbins or small cobs, while Hickory King will produce a far larger number of good cobs. The same objection holds good in the case of pure Boone County or White Horsetooth, the former in particular yielding a very high percentage of nubbins unless the soil is in a high state of fertility. A further objection to the two latter varieties is their susceptibility to attacks of blight (*Helminthosporium turcicum*, Pass.), in this respect contrasting unfavourably with Salisbury White and Hickory King, which are practically immune to this pest.

Practically speaking, it is impossible to breed a mealie so that it has only one fixed number of rows. Eight-row Hickory King will always throw a quantity of 10-row and a smaller quantity of 12-row cobs. Ten-row Hickory King will throw 8 and 12-row cobs, and occasionally 14-row cobs. Salisbury White has a still greater range owing to its parentage, but in well-bred Salisbury White seed the large majority should be 12-row. Continual selection at the Gwebi Experiment Farm shewed a great improvement in this respect, and the Salisbury White now produced there throws about 70-80 per cent. of 12-row cobs. An experiment conducted last year to determine the result to be obtained from sowing 14-row Salisbury White (from 12-row parents the previous year), shewed that these threw from 50-60 per cent. 12-row cobs, the majority of the remainder having from 14 to 18 rows, with the cobs of a distinctly Boone County type.

The size of the cobs as regards length and circumference will also exhibit a great deal of variation. Excessive length in the case of Hickory King should be avoided, as it tends to be accompanied by shallowness of grain. In the same way excessive width (as shewn by the circumference in the case of Salisbury White) denotes usually a thick core. The attempts to lay down standard measurements with regard to length and circumference have for their object the production of seed which will ensure the best quality and quantity of grain in the field. A length of over 9 ins. in 8-row Hickory King is an unstable variation, which is not likely to reproduce itself to any great extent. On the other hand, a length of 8½ to 9 ins.



is not only more constant when propagated, but is accompanied by greater depth in the grain. This may be stated in other words by saying that no advantage is to be gained in the present state of 8-row Hickory King by selecting seed with a greater length than 9 ins. By dealing with Hickory King 10-row and Salisbury White 12-row in the same way, the following standards have been arrived at:—

|  | Length      | Circumference at 2 in. from butt | Weight of cob | Percentage of grain to ear |
|--|-------------|----------------------------------|---------------|----------------------------|
| Hickory King, 8-row -  | 8½ to 9 in. | 6 to 6½ in.                      | Up to 12 ozs. | Up to 90%                  |
| „ „ 10-row -   | 9 to 9½ in. | 6½ to 7 in.                      | Up to 14 ozs. | Up to 88%                  |
| Salisbury White, 12-row  | 9 to 9½ in. | 7½ to 8 in.                      | Up to 16 ozs. | Up to 88%                  |
| Average of all prize-winning flat whites at the Maize Congress, Johannesburg, 1911 - | 9.6 in.     | 7.2 in.                          | 14.8 ozs.     | —                          |

It is sometimes usual to give standard measurements for the cob at two inches from the *tip*. As a cob should be cylindrical in shape, this should approach the butt measurement as far as possible, and the difference between the two should not exceed one inch.

As a result of a number of trials in Rhodesia with good cobs in the field in 1910, the following results were obtained. As far as possible the cobs were 9 inches in length, and were not necessarily show ears:—

|                           | Weight of cob | Grain only | Percentage of grain |
|---------------------------|---------------|------------|---------------------|
| Hickory King, 8-row -     | 10 ozs.       | 9½ ozs.    | 89.3 %              |
| „ „ 10-row -              | 12¼ ozs.      | 10½ ozs.   | 88.0 %              |
| Salisbury White, 12-row - | 15 ozs.       | 13¾ ozs.   | 87.9 %              |

The bushel weight is of less importance in the case of maize than in the case of such cereals as wheats and oats. It is reflected fairly accurately in the weight of a muid sack of mealies—the greater the bushel weight the heavier the sack of

mealies. Flat yellow mealies have a heavier bushel weight than flat whites. At the Maize Congress, Johannesburg, an average of all flat yellows shewed 59 lbs. to the bushel, as against an average of 56 lbs. for all whites. In Rhodesia the average for flat whites varies from 55 lbs., in the case of Hickory King, to 59 lbs., in the case of Salisbury White. (Test made at the Botanical Experiment Station, 1913.)

With regard to the moisture content of maize—an exceedingly important feature in the transport of maize over long distances—Rhodesian farmers are very favourably situated. It is generally considered that mealies should not have a higher moisture content than 12 per cent. Tests conducted by the Division of Chemistry shew that the moisture content varies greatly after harvesting. Of twelve samples analysed in October, 1912, the moisture content varied from 7.1 per cent. to 11.5 per cent. These samples were subsequently analysed once monthly, and they shewed a considerable absorption of moisture during the rainy season, but only at one period did the total moisture exceed 12 per cent. This was on the 14th April, 1913, when two of the samples shewed 12.2 and 12.3 per cent. respectively.

The relative value of each feature of the cob is shewn in the score card used in judging the maize classes at the show. It appears as follows:—

| SCORE CARD.                               |     |     |     |     | POINTS   |         |
|---|-----|-----|-----|-----|----------|---------|
|   |     |     |     |     | Possible | Awarded |
| 1. Uniformity of exhibit                  | ... | ... | ... | ... | 5        |         |
| 2. Trueness of type and breed             | ... | ... | ... | ... | 5        |         |
| 3. Shape of ears and straightness of rows |     |     |     |     | 10       |         |
| 4. Colour of grain                        | ... | ... | ... | ... | 5        |         |
| 5. Colour of cob                          | ... | ... | ... | ... | 5        |         |
| 6. Market condition                       | ... | ... | ... | ... | 5        |         |
| 7. Quality of tips                        | ... | ... | ... | ... | 5        |         |
| 8. Quality of butts                       | ... | ... | ... | ... | 5        |         |
| 9. Kernel uniformity and length           | ... | ... | ... | ... | 10       |         |
| 10. Length of ears                        | ... | ... | ... | ... | 10       |         |
| 11. Circumference of ears                 | ... | ... | ... | ... | 5        |         |
| 12. Space between rows                    | ... | ... | ... | ... | 5        |         |
| 13. Space between kernels                 | ... | ... | ... | ... | 5        |         |
| 14. Percentage of grain to ear            | ... | ... | ... | ... | 20       |         |
| Total                                     |     |     |     |     | 100      |         |



## NOTES.

1 & 2. This applies when 10 cobs are required in a class. This uniformity shews that the cobs are breeding fairly true to the type aimed at, without the deviations that are the marks of an unfixed hybrid.

6. Marks deducted for undue moisture, discoloration, or insect attacks, which would cause any deterioration in the grain.

12. Undue spacing between the rows is a defect most frequently found in 8-row Hickory King; far less in 10-row Hickory King and Salisbury White.

Rhodesia has reason to be proud of the high standard of excellence in maize attained in such a short period. There is no doubt that this is due very largely to the fact that the farmers have confined their attention to the two varieties which have done so well. There seems to be no urgent reason for departing from this policy by introducing early maturing or yellow varieties. The danger of admixture would be great, and the lowering of the standard that would necessarily follow such an admixture would not be compensated in any way by the introduction of lower yielding varieties which might mature a few weeks earlier. In normal years our seasons are more than sufficiently long to enable us to mature to perfection the Hickory King and Salisbury White varieties, which have proved themselves to be such good yielders and so resistant to pest.

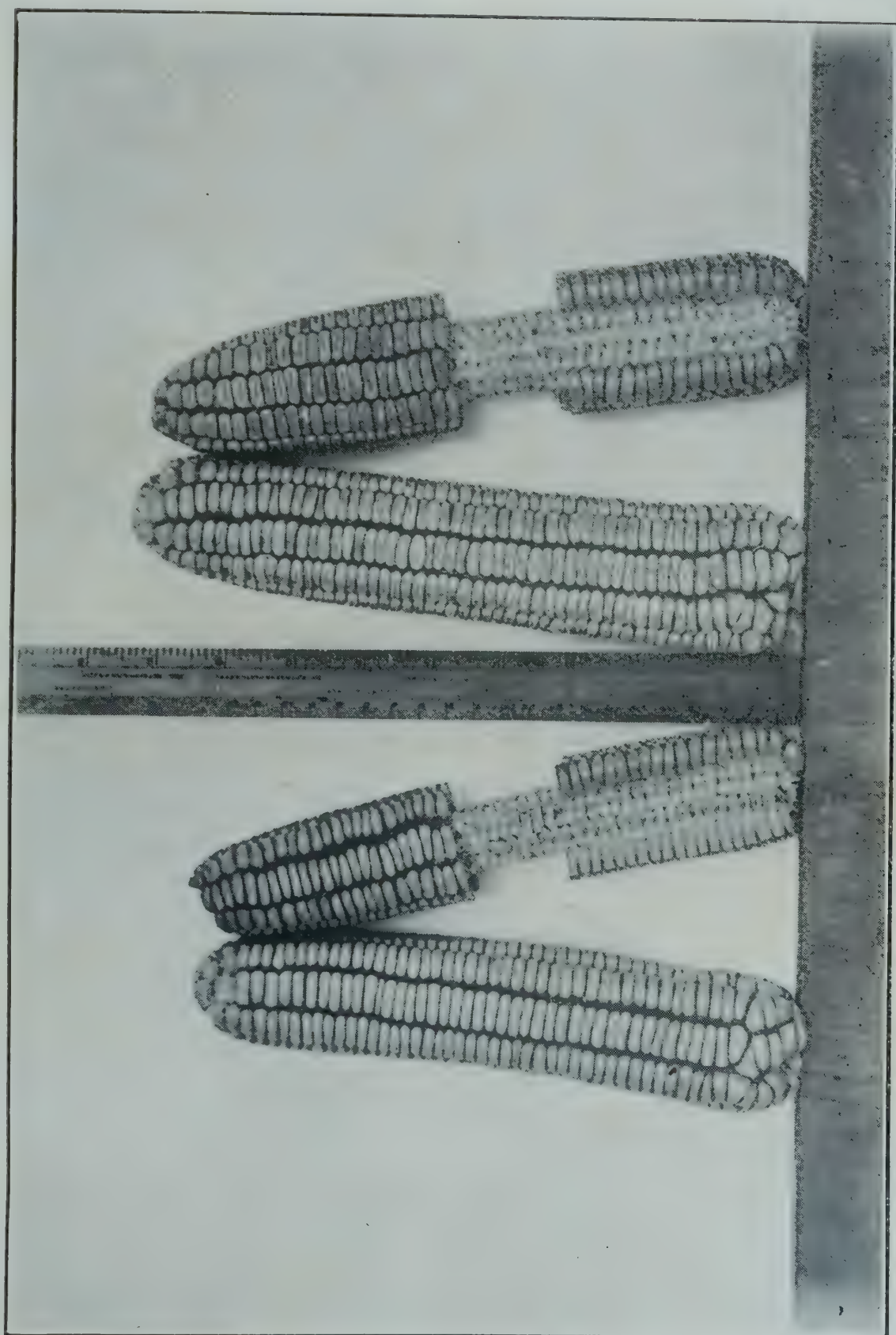
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## Correction.

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### CITRUS FRUIT TREES.

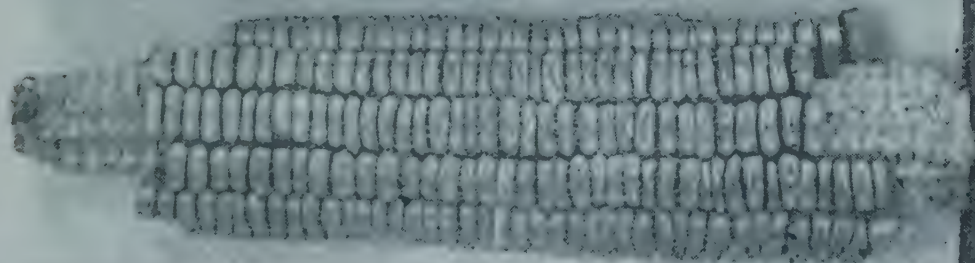
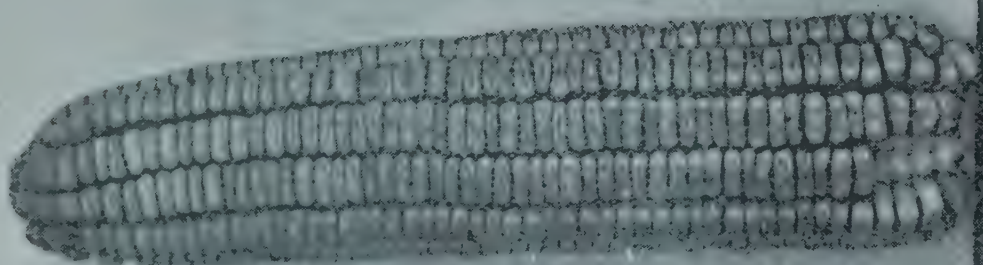
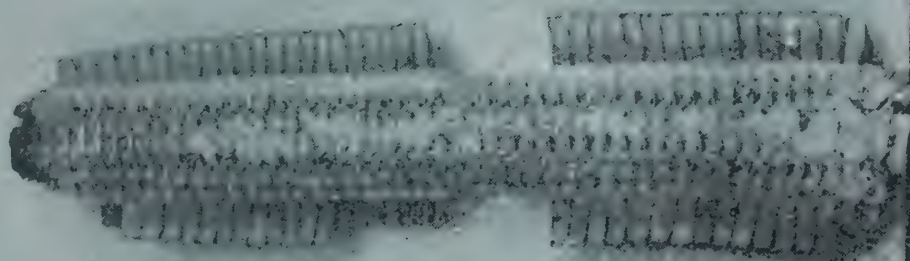
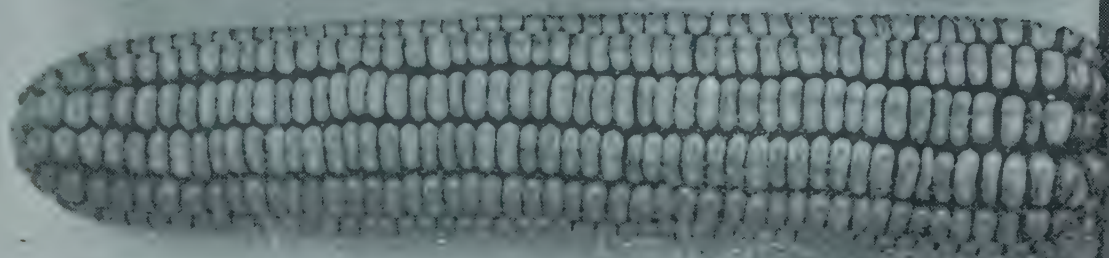
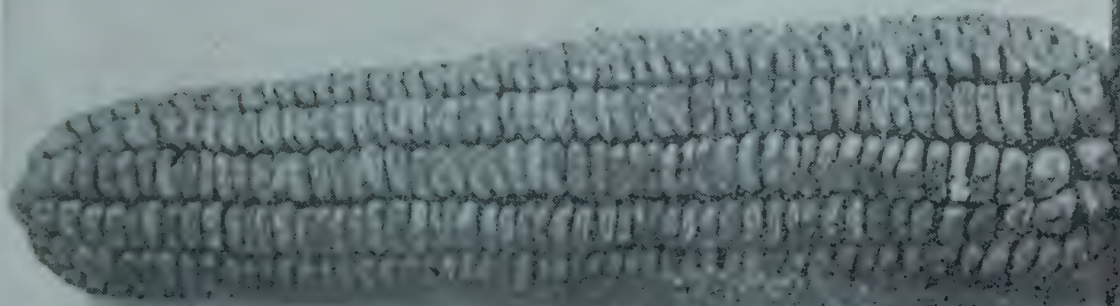
On page 839 of the August number of the *Rhodesia Agricultural Journal*, line 7, read:—"If these species exist in Rhodesia and nip off the tiny plants, give the beds a dusting with air-slaked lime or hard-wood ashes."



8-row Hickory King on left, 10-row Hickory King on right ; shewing comparative types.

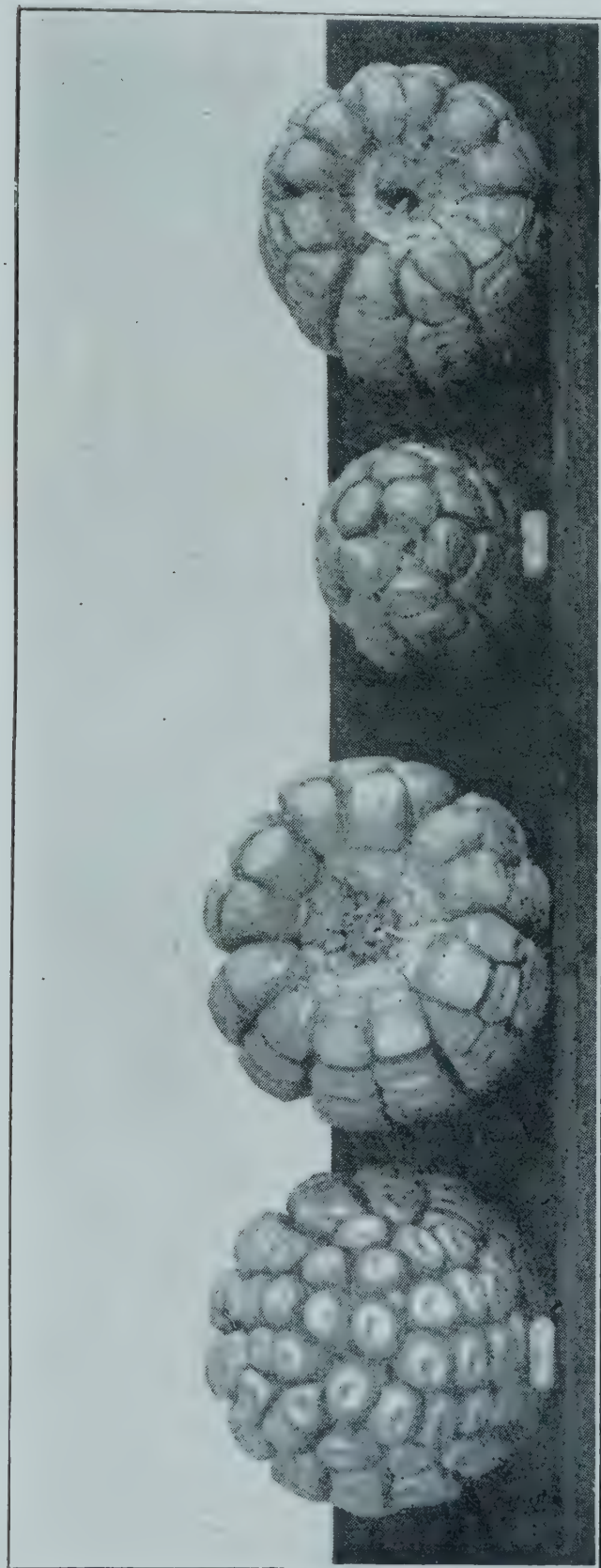












Good tips and butts. Salisbury White on left; 8-row Hickory King on right.





## The Possibilities of Closer Settlement in Matabeleland.

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By A. CURTIS, Figtree.

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It is admitted by all that the great need of Rhodesia is white population. It is also very often said that the future of Rhodesia lies in cattle ranching. That may be so, but it is very certain that a Rhodesia of cattle ranches will mean a very small population. I consider that the hope for the country lies in cattle ranching for the companies and the wealthy man, but coupled with what will be far better—closer settlement with a dairy export trade for the small man. We are assured by experts that the quality of Rhodesian butter is good enough for London, and that it could be produced here more cheaply and landed at Home at less cost than is done in Australia. In organising closer settlement in Rhodesia on the land adjacent to the railways with the necessary capital to start things, we might proceed somewhat as follows:—The land would be cut up into blocks of 500 acres and fenced; where a natural water supply did not exist, such would be provided by wells or boreholes; 100 acres of the best of it would also be fenced off to provide lands for cultivation. Such blocks of land, fenced, with assured water supply and handy to the railway would be well worth £1 an acre, and would, I believe, be readily taken up if easy terms were also offered. Suppose the first settler has now arrived and taken up his block of land, I would then offer him the following as a plan by which he ought to make a decent living. We will suppose he can start with 30 good dairy cows, fed and looked after properly. With 15 in milk at a time, these should at any rate each give him 1 lb. of butter fat a day, worth in the future, say, 9d., giving him roughly a return of £180 a year from his cows. He would keep fowls, of course, which would at least bring him in £24



a year. Pigs he would also keep, having skimmed milk available; say, four breeding sows giving two litters a year of five in each litter, to be sold at seven months, weighing about 180 lbs. each. This would bring him in another £120 per year—to be on the safe side, say, £80 a year. Fifty acres of his land he could plant with mealies, giving him, say, 250 bags, 150 of which he could sell, bringing him in, at 10s., £75; two acres planted to potatoes would produce, say, £40 profit after paying for seed. Pumpkins and side lines should produce another £20, making, say, £420 a year. His native labour bill would not be more than £6 a month, as, being a small farm and fenced, he would not require herd boys; their food would come out of the 100 bags of mealies he keeps back, consuming 30 bags, the other 70 being kept for emergencies and sold when not required. With ordinary luck he would make a profit of £300 a year for his living expenses and to pay off the purchase price. A few only of the best calves he would also rear, and be able to sell in order to swell the profits.

To feed the cows and pigs cheaply he would have to use a careful system of cultivation. For the cows, ensilage is the cheapest and probably, all things considered, the best food he could depend on as his mainstay. It will give 10 tons to the acre from a moderate crop of mealies costing not more than 3s. a ton, which includes ploughing, sowing, cultivating, reaping, riding and stacking. It would be advisable to plant 12 acres of mealies for this purpose, giving, say, 100 tons of ensilage, which would be sufficient for his 30 cows as well as for some of his oxen and calves. Seven acres ploughed, just sprinkled with manure and sown broadcast with mealies, kafir corn and kafir beans will give him about 20 tons of first-class dry fodder. An acre planted with Zunga Munga or Napier's fodder will give an extraordinary crop, providing feedings of green stuff right up to the heaviest of frosts that we get. An acre or so of barley or rye would also come in handy, as would also an acre of mealies planted late and thick for cuttings of green food. With these plantings, I would recommend the following plan of feeding the cows. If the farm is a decent grass veld in December, January, February and March, grazing on the 400 acres will be sufficient to keep the milk going strong. In April start feeding at night with cuttings of the

mealies planted for that purpose; in May and June they would get the same or cuttings of barley, rye and Napier's fodder. About the middle of June, the mealies being reaped, they would be turned into the 50-acre patch, which will keep them going to the end of July, and if with the last cultivation rye or something similar has been planted amongst the mealies, nothing more will be required to keep up the milk supply. In August he would start feeding ensilage and dry fodder as much as they would eat until the end of November.

For the pigs, a few acres of pumpkins and majorda melons fed in conjunction with the skim milk will provide ample food. The making of ensilage, which is so important a food to make a success of dairy farming (it is also useful for the pigs), is the easiest thing in the world when one knows how. No expensive machinery is required, as it is stacked or pitted whole. For pits, just a hole in the ground is quite satisfactory, and it cannot go wrong if it is well covered at the finish with a load of hay or rubbish, and then with earth or sand to keep all air out. With stack ensilage in rectangular stacks, with rows of poles about 2 ft. apart along each long side to keep it together, treated in the same way—that is, a good covering of hay on the top, and then stones or logs on top of that—there is no expense, and my experience shews there is little waste. Nicely packed, after removing only three inches from the top, the good, sound ensilage begins. At each end where the butt ends of the stalks are, there is, of course, about a foot of waste. Two thousand farmers settled on blocks of this description and producing each £200 worth of butter a year, a total of, say, £400,000, would be a fair beginning to what I like to think is the future of Rhodesia—export of dairy produce to London. For a long time to come there would be the local demand to fulfil, and the farmer would get considerably more than the 9d. a day; in fact, 1s. 6d. if he makes his own butter. Closer settlement would also make such a difference to the amenities of life amongst the farming community. To-day on these huge farms, except for the few who are near town and can get in for a change pretty often, life is dull and trying, especially for the women; while if sickness occurs or children come along, trying indeed is the lot of the farmer, and more so of his wife, as things are now with the nearest neighbour miles away. Closer settlement would change all that; dances,



picnics, Church services, and social intercourse generally would be the rule, changing the present dull, drab existence to a state of life worth living. Closer settlement would also mean that co-operation would become the order of the day, in the buying and selling of seeds, produce, fertilisers, oils, machinery, etc., enabling the farmer to take advantage of the generous reduction in rates on 10-ton lots which the railway authorities are apt to offer him, and for which he thanks them with a wry smile, knowing full well that the reduction is not going to benefit him. The land chosen for such settlement would have to be in healthy situations where there is no fever. Mashonaland no doubt is a marvellous agricultural country, but I have in mind the country along the railway from Plumtree to Bulawayo, and then on to Gwelo; the Woolandale Estate is admirably suited for the purpose. With the proposed daily motor train service between Plumtree and Bulawayo, great things could be achieved on that section. It is rather the fashion to look down on Matabeleland just now, which is utter nonsense. In normal years, which presumably we shall get again, Matabeleland can grow grain. Despised Plumtree was and will be again one of the largest grain centres in Rhodesia. In writing of the probable returns for the closer settlement man, I am aware that I have put them very low, but experience has shewn that for the first few years returns are low. Each year, by careful feeding, breeding and selection, his returns would be better from the cows, and consequently from the pigs. By the system of feeding advocated, a great deal of manure could be accumulated, which would be returned to the lands, and I see no reason why the returns I have given should not be doubled in time. To induce settlers to come to Rhodesia, the terms of payment for the land should be very easy, say, 25 years. With these terms a man would have practically all his capital available for the purchase of stock and implements for buildings and for his living expenses for the first year. The class attracted would be of the right stamp for Rhodesia, which surely has a climate comparing very favourably with that of Canada. The inducements would be as great as those offered by that country, and without the fearful drudgery which, it appears to me, must be involved in farming there; yet Canada can get its thousands of new-comers weekly. With a bacon factory running, and the Liebig Company also probably a

buyer of pigs, the breeding of these animals could be largely extended. Mealies fed to pigs will bring in a return of 15s. a bag.

A dairy export to Great Britain should be the end in view, and with that in mind we want a large number of settlers—not a few. With creameries starting in Rhodesia, I can see in the near future a glut of butter, etc., and yet with the country sparsely settled not enough for export abroad, so I would urge the advisability of closer settlement being undertaken on a large scale, by which means the supply will create the necessary market.

Accustomed as we are to 3,000 and 6,000 acre farms, it may be urged that 500 acres is too small a farm for this country, but it must be remembered that veld which is well eaten down by cattle (without going to the extreme of overstocking) and not burnt off, soon shews a great improvement as a result of the feeding down and consequent manuring which it receives. My own experience for the last few years has been on what is known as a sand veld farm, and I can see the great improvement that has taken place. Where well eaten off and on old lands, couch or quick grass taking the place of wire grass formerly, M'Tenya, or damp ground, worthless from a grazing point of view, ploughed and lightly dressed with manure, gives a wonderful crop of sweet grass, affording two cuttings of hay in favourable seasons. After all, a 500-acre farm is not far short of a mile square.



# Hints on Irrigation.

## PUMPING PLANTS.

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By W. MARTIN WATT, Agricultural Engineer.

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Many of the larger rivers of this country carry or hold large bodies of water throughout the dry season, but have so little fall that their waters cannot be brought on to the land by gravitation. In such cases, if irrigation is to be adopted, recourse will have to be had to pumping, and the following notes are intended as a guide to farmers contemplating the erection of a pumping plant.

To commence with, a word of warning is necessary. Irrigation, by pumping, is almost invariably much more expensive than a scheme relying upon gravitation only, and in a country such as Southern Rhodesia, particular care should be taken in endeavouring to ascertain whether the installation of a plant is justified. The value of irrigated land varies very considerably. On one occasion the writer asked a prominent farmer in the Willowmore district of the Cape Province what he considered an acre of lucerne under irrigation was worth. His reply was that one acre the previous year had been well worth over £100 to him, his reasons being that by means of it he had been able to save stock of over that value, while his neighbours, with no lucerne as a stand-by, had lost stock to the value of thousands of pounds. The contention is that if a farmer intends growing green foodstuffs under irrigation for his stock to assist them over times of drought or sickness, it is almost impossible to lay down arbitrarily the value of an acre of irrigated land. When, however, it is intended to grow produce for the market, one has something more definite to go upon. In doing so, however, one has to carefully consider the probable fertility of the soil, the permanency of the water supply, and the market facilities. The life of a pumping

plant under fair conditions should not be calculated upon as lasting more than ten years, and in considering the market facilities the possibilities of competition by neighbours within that period should be taken into consideration. Potatoes, onions and other vegetables and green food for stock grown in the dry months under irrigation command high prices at present, but if the irrigated area increases without a corresponding increase of our population, and a consequent increased demand for their products, the present prevailing prices are bound to drop. Fruit trees, especially citrus groves, may prove to be a crop likely to yield increased returns by the artificial application of water during the dry months.

In Southern Rhodesia it is not generally necessary to irrigate during the five wet months (November-March), and during that period the power plant, primarily installed for irrigation, might be used for driving many other machines required on the farm. By so utilising the power, the whole cost of the plant would not fall solely upon the irrigation works.

In selecting a pumping plant for irrigation purposes, the first thing to do is to ascertain the quantity of water that will be required to irrigate a certain area of land. Should the supply of water in the stream or pool we intend pumping from be limited, the area irrigable would be restricted by the water supply, and the plant designed accordingly.

Assuming, however, that we have a good and sufficient supply of water, and that we want to irrigate ten acres of land, of which area it is intended to place five acres under some cereal crop, and the remaining five acres under some such vegetable as potatoes, our cereals will probably require a watering equivalent to three inches of rainfall once every 20 days, and our potatoes a similar watering once every ten days. Remembering that an acre is 43,560 square feet in area, and that consequently a one-foot layer of water on an acre is equal to 43,560 cubic feet, a 3-inch watering would obviously be equal to one-fourth of this amount, *i.e.* 10,890 cubic feet. The unit used generally in estimating the capacity of a pump is the gallon per minute, and in this connection it is as well to bear in mind that the U.S.A. gallon is in common use, but is smaller than the English Imperial gallon (four Imperial gallons equal five U.S.A. gallons). Knowing that 10,890 cubic



feet is equivalent to a 3-inch watering to one acre, we have now to ascertain how many gallons will be required per minute. To do this we must first decide the number of hours each day that we intend the pump to work. In the following calculation, as an illustration, I am going to assume that the pump will be run eight hours every day:—

| <i>Five Acres of Cereals.</i>  | <i>Five Acres of Potatoes.</i>   |
|--|--|
| Requiring a 3-inch watering every 20 days. Therefore, a quarter of an acre must be irrigated every day.    | Requiring a 3-inch watering every 10 days. Therefore, half an acre must be irrigated every day.          |
| 10,890 cubic feet = a 3-inch watering to one acre.   | 10,890 cubic feet = a 3-inch watering to one acre.   |
| Therefore, $\frac{10,890}{4} = 2,723$ cubic feet (approx.)<br>= a 3-inch watering to a quarter of an acre. | Therefore, $\frac{10,890}{2} = 5,445$ cubic feet<br>= a 3-inch watering to half an acre.                 |
| This means that a total daily supply of 2,723 cubic feet is required for the irrigation of the cereals.    | This means that a total daily supply of 5,445 cubic feet is required for the irrigation of the potatoes. |

Adding the total daily supply required for the cereals to that required for the potatoes, we get  $2,723 + 5,445 = 8,168$  cubic feet required per day for the whole area of 10 acres. Now we have to supply this quantity in 8 hours. Eight hours = 480 minutes; therefore,  $\frac{8,168}{480} = 17$  cubic feet will be required per minute. There are about 6.23 gallons in a cubic foot of water. Hence  $17 \times 6.23 = 106$  gallons are required per minute. To allow for absorption and evaporation losses in the furrows, and for possible stoppage of the plant, about 50 per cent. should be added, which would make the required supply about 160 gallons per minute.

In order to ascertain the power that would be wanted to deliver this quantity of water it is necessary to ascertain—

- (1) the total vertical height to which the water has to be raised;
- (2) the total length of the pumping main;
- (3) the diameter of the pumping main;
- (4) the altitude above sea level of the place where plant is to work.

The total vertical height to which the water has to be raised can be ascertained by levelling. A simple method of levelling by means of a straight edge and ordinary carpenter's spirit level was described by the author in a previous article (*vide* Bulletin No. 64—"Hints on Irrigation: Small Gravitation Schemes"), by means of which the vertical head may be ascertained with a sufficient degree of accuracy. The length of the pumping main is easily ascertainable, but it is not so easy to find out the most economical diameter for the piping. To illustrate this difficulty, assume the pumping main is 1,000 feet in length and that we have to deliver 160 gallons a minute through it. By using a 6-inch diameter main the loss of head due to friction would amount to about 5 feet; that means that 5 feet would have to be added to the actual head ascertained by levelling, as our engine will have to be strong enough to overcome this friction in addition to lifting the water. If a 4-inch diameter main be used, the friction head would amount to about 35 feet, and if a 3-inch, to about 130 feet. The reason for this is that the friction in the pipe varies as the square of the velocity. The formulæ for ascertaining the friction in pipes are too complicated to give here, especially as they depend on a variable co-efficient, but enough has been said to shew the importance of having the diameter of the pumping main economically designed. If it is made too large, money is wasted in the pipe line; while if too small, an unnecessarily powerful engine will be required. Where the services of an independent engineer are not available, the best size for the main should be left with the firms tendering for the plant.

The reason why the altitude of the place where the plant has to work is required is due to the fact that 3 per cent. efficiency is lost for every 1,000 feet rise above sea level, owing to the reduction of atmospheric pressure.

To ascertain the power required, it is first necessary to ascertain how power is measured. The unit of work done is the "foot-pound," *i.e.*, the work performed by raising one pound one foot high. Ten pounds raised one foot would equal 10 foot-pounds; one pound raised 10 feet would also equal 10 foot-pounds; while 10 pounds raised 10 feet would equal  $10 \times 10 = 100$  foot-pounds. James Watt, the inventor of the steam engine, adopted horse power as the unit of measurement,



and the horse power of an engine is 33,000 foot-pounds per minute. That is for every horse power 33,000 foot-pounds of work must have been performed per minute. For instance, 330 pounds raised 100 feet high in one minute would equal one horse power; 33 pounds raised 1,000 feet in one minute would also equal one horse power.

The following units of power are in common use:—

- (1) Theoretical horse power (T.H.P.).
- (2) Indicated horse power (I.H.P.).
- (3) Nominal horse power (N.H.P.).
- (4) Brake horse power (B.H.P.).

T.H.P. is the power that would be developed in theory, and takes no account of the losses by friction, slipping of valves, belts, etc., which may occur in the engine and pump.

I.H.P. is the power that is done in the engine cylinder, and is indicated as being greater than that actually done in driving the whole plant.

N.H.P. is what it implies—purely nominal. It is frequently mentioned in connection with steam engines and boilers, but as it bears no fixed relation to the actual power which the engine may develop, it will be best left alone.

B.H.P. is the measurement of the work actually done, including all frictional losses, belt slipping, etc., in the engine, pump and machinery, and is the only measurement upon which an order for a pumping plant should be placed. It is the amount of power that would have to be applied to stop the plant when working at its full capacity. To ascertain the brake horse power required for our engine, multiply the gallons required per minute by 10 to get pounds per minute (1 gallon weighs 10 lbs.), and multiply this by the sum of the actual head and friction head in the pumping main; by dividing this result by 33,000 (the number of foot-pounds in a horse power), the theoretical horse power is obtained. To the t.h.p. thus obtained, add 3 per cent. for every 1,000 feet of altitude, double the result, and then add 20 per cent., and this will give the approximate b.h.p. required.

As an illustration, assuming we require 160 gallons per minute through a 6-inch diameter pumping main 1,000 feet

long, which has been found to give 5 feet of friction head, and that the actual head to be pumped against is 100 feet and our altitude 4,000 feet, our formula would be:—

$$\text{T.H.P.} = \frac{(160 \times 10 \text{ pounds}) \times (100 + 5 \text{ feet})}{33,000} = 5.1$$

Owing to our altitude being 4,000 feet, 12 per cent. has to be added to the above result, which gives 5.7. This should then be doubled, and 20 per cent. added to the result to allow for efficiency, etc., of plant:—

$$(5.7 \times 2) + 20 \text{ per cent.} = 13.7 \text{ b.h.p.}$$

The next point to be considered is the selection of the plant, and the following classes of power engines will be discussed:—Wind, water, steam, oil, and suction gas.

Wind has a great advantage in being a cheap form of power, but it has the disadvantage of only being available during spasmodic periods. Where wind-power is used it is necessary to provide storage, and the storage capacity should be capable of holding at least 24 hours' supply based on the capacity of the mill when working with a 12-mile wind. In ordering a windmill, care should be taken to ascertain what wind velocity the makers rely upon for their statements. Assuming a 6-mile wind driving a plant delivered 36 gallons per minute, with a 12-mile wind the plant would in theory deliver 144 gallons, and with an 18-mile wind 324 gallons. The different ratios depend upon the fact that the power depends upon the square of the velocity of the wind, *i.e.*, a wind with a velocity of unit 1 would give a power of  $1 \times 1 = 1$ , while a wind with a velocity of unit 2 would give a power of  $2 \times 2 = 4$ , or double the wind velocity, and you get four times the power, frictional losses in the wind engine and plant being omitted. For some considerable time anemometers have been installed at Bulawayo and Salisbury, but the practical value of the records from these instruments is unfortunately of little value, as they are only read once in 24 hours, and merely shew the number of miles of wind recorded during that period, not shewing whether the wind velocity was spread over the whole period or concentrated over a few hours. In order to obtain data of a practical nature the Government, at the author's request, recently installed an anemograph at the Government



Agricultural Laboratories, Salisbury, and as the wind pressures are recorded on a daily chart moving by clockwork, the actual number of hours in any day or month during which a working wind for a wind engine is likely to be available may be ascertained. It is hoped in the course of about seven months to publish this information in a later edition of this *Journal*. The wind engine is in common use throughout this country, and needs no description. The size of wheel in use rarely, if ever, exceeds 16 feet in diameter, but there is no valid reason why very much larger and more powerful wheels should not be installed. The height of the tower, which supports the wheel, is governed by the situation, *i.e.*, whether shut in or open, but it is false economy to have the tower too low, as wind velocities increase as one gets above the retarding influences caused by the frictional resistance of the earth's surface, trees and other growth.

Water is an equally cheap source of power, but in order to be utilised a free fall must be available. There are three main types of water-driven engines, the hydraulic ram, the water-wheel, and the turbine. The ram is a self-contained engine and pump, while the water-wheel and turbine are purely power producers, the power derived from which could be utilised to drive other machines besides a pump. To calculate the theoretical horse power of falling water, the following formula may be used:—

$$\text{T.H.P.} = \frac{(\text{gallons falling per minute} \times 10 \text{ pounds}) \times \text{vertical height of fall in feet}}{33,000}$$

As an instance, assume 1,000 gallons flow per minute over a fall of 12 feet; the calculation would be:—

$$\frac{(1,000 \times 10 \text{ pounds}) \times 12 \text{ feet}}{33,000} = 3.64 \text{ t.h.p.}$$

Water-wheels, however, do not realise all the power as ascertained by the above theoretical formula. Undershot wheels may develop only one-fourth to one-third of the theoretical power; breast wheels, one-half; rams, one-half to two-thirds; overshot wheels, two-thirds to three-fourths; and turbines, three-fourths; all according to the skill in designing and constructing the several engines.

From the foregoing information, if a breast wheel was to be installed, the t.h.p. of 3.64 previously ascertained would have to be multiplied by  $\frac{1}{2}$ , which would give the actual horse power available as 1.82. To this a further allowance would have to be made for friction in the pump and pumping main. The theory of the hydraulic ram is similar to that of a water-wheel, but may be more simply expressed by the following formula:—

$$\begin{array}{ccccccc} \text{Quantity of} & & \text{Fall} & & \text{Quantity of} & & \text{Height water} \\ \text{drive water} & & \text{avail-} & & \text{water delivered} & & \text{has to be} \\ \text{in galls.} & \times & \text{able} & = & \text{in galls.} & \times & \text{raised} \\ \text{per minute} & & \text{in feet} & & \text{per minute} & & \text{in feet} \end{array}$$

For instance, assuming 500 gallons per minute fall 5 feet, and that we wish to raise water 100 feet, we would be able, in theory, to raise 25 gallons per minute, because by the above formula:—

$$500 \text{ galls.} \times 5 \text{ feet} = 25 \text{ galls.} \times 100 \text{ feet}$$

In practice, however, the result should be halved, and a further allowance made for loss by friction in the pumping main. In ordering any water-power engine, a farmer is strongly advised to obtain advice from a competent engineer.

If neither wind nor water power is available, or if these sources of power are insufficient for our requirements, recourse may be had to steam, oil, or suction gas engines. In a country such as Southern Rhodesia, where timber is usually available in large quantities, a steam engine has many advantages, but it requires skilled supervision, a chemically-pure water for the boiler, periodical cleaning of the boiler tubes, and unless properly housed and carefully looked after its working life may be very short indeed. For a steam plant efficiently worked, housed and attended to, at least 10 per cent. should be knocked off the capital cost of the plant annually, to cover depreciation. Steam engines are not recommended for small installations. In deciding upon the type of plant, consideration should be given to whether an engine of a stationary or portable type will best suit the conditions.

Oil engines have the great advantage of being easily started and comparatively easily worked, but they necessitate a regular cash outlay for oil fuel, and this is not always convenient. Money, of course, has to be expended in cutting and



getting wood fuel for a steam plant, but this hits the farmer in a different way, as frequently it can be done by his own farm labourers in their spare time. Oil engines are run by refined petroleum, or, by means of a special carburetter, by paraffin, the engine being started by the more volatile petroleum. The oil fuel consumption varies from 0.7 to 1 pint per b.h.p. per hour, *e.g.*, a 5 b.h.p. engine running 8 hours per day on a consumption of 1 pint per b.h.p. per hour, would consume 40 pints per day.

Suction gas plants are coming into great favour in the Cape Province. Apart from the engine proper, they consist of a generator, where the gas is generated, and a scrubber, where the gas is cleaned before entering the engine cylinder. The term suction gas arises from the action of the engine drawing or sucking the gas from the generator into the cylinder. For plants of over 6 b.h.p. where wood fuel is scarce, they may prove the most economical type of engine. The gas may be generated from good clean anthracite or from good charcoal, or gas-coke. About 1 lb. of anthracite will develop 1 b.h.p. per hour.

There is a large variety of makes of pumps, but these may for our purpose be considered under three main heads:—Bucket or scoop pumps, suction, plunger, ram or reciprocating pumps, and rotary or centrifugal pumps.

Bucket or scoop pumps are a development of the simplest type of apparatus used by the “ancients” for raising water. The one in most common use in this country is known as the “Moria,” and consists of a series of buckets fastened to an endless chain and suspended over a toothed wheel, which, by gearing, may be made to revolve, carrying the buckets with it. The smaller sizes may be operated by hand, but the larger ones are usually driven from a gin driven by horses, mules, oxen or donkeys. For low lifts (say under 20 feet), and where no large area has to be irrigated, they give quite good and economical results.

Reciprocating pumps are those in most common use. The ordinary hand-pump and windmill-pump are of this variety. The reciprocating pumps have the great advantage, which should not be lost sight of in making a selection, in being able to work with any varying load below the maximum. For

instance, if it were wanted, on a project where water had to be raised to a maximum height of 100 feet, to tap the main at 50 feet or elsewhere, this could be done without any serious loss of efficiency. With a centrifugal pump this could not be done, as the pumping action of a centrifugal pump depends upon the velocity at which the rams of the wheel in the pump casing revolve. These rams or impellers rotate at very high velocities, and must be installed so as to maintain as nearly as possible the velocity designed for by the manufacturer. This velocity could not be maintained if the pump had to work with varying loads. If too heavy a load is given, the impellers of the pump will lose their speed, until a time is reached when they go so slowly that they cannot raise water at all; while if the load given is too light, the velocity will be increased, and the extra power expended in thus increasing the velocity is wasted in churning the water which it cannot raise. Where, however, water has to be raised to one fixed height, and the lift is not too high, a centrifugal pump is economical and efficient, and is cheap in first cost. Reciprocating pumps can be made to pump practically any quantity of water to any height. The lift of a centrifugal pump is, however, somewhat limited (say 60 feet), and while compound forms of this class of pump are made, which can raise water against much greater head, it is generally at the cost of efficiency. Before deciding whether to instal a centrifugal or a reciprocating pump, it will, however, generally be found advisable to consult an engineer. In this country, with our high altitude, the pump, whether reciprocating or centrifugal, should be kept as close to the water level from which it is desired to pump as possible, and this height should never exceed 15 feet.

In estimating the cost of an irrigation pumping plant, the following annual charges should be allowed for:—

- 10 per cent for depreciation;
- 6 per cent interest on capital outlay;
- cost of fuel;
- cost of lubricants, engine-room, waste, etc.;
- labour charges;

and if these charges are likely to be more than covered by the probable return expected from the crops, a plant might be installed,



A form prepared originally by the Irrigation Department of the Cape Province is appended to this article, giving a list of the particulars which an engineering firm require, in order to give a quotation for a pumping plant.

In conclusion, give any engine you may purchase the attention it deserves. See that it has good housing, in as water-tight and dust-proof a building as possible. After working, see that it is thoroughly cleaned to remove dust, and at the same time see that no nuts or screws have worked loose. Only the best lubricating oils and engine-room waste should be employed. No tools should on any account be removed from the engine-room. The maker's instructions should be strictly adhered to, and should be kept hung up in a conspicuous place in the engine-room.

*Form of Invitation for Tender for Pumping Plant.*

To.....  
.....  
.....

You are invited to tender for the supply of a pumping plant required for irrigation purposes by Mr. ....  
of .....

Following is a schedule of requirements, with full particulars, on which you should base your tender:—

- Altitude above sea level of place where plant is to work .....
- Quantity of water per minute.....
- Greatest height water has to be pumped, including suction (actual lift only, exclusive of friction head in pipes).....
- Greatest height required for suction lift.....
- Total length of pumping main, including both suction and delivery.....
- Diameter of pumping main (internal).....
- Kind of pipes required.....
- Hours during which it is proposed to run the engine continuously.....

The type of engine which it is proposed to use, and which should be tendered for. The actual make is left to the tenderer, but it must include all parts required for continuous work, and all loose tools required.....

Brake horse power of engine which should be provided (measured at sea level).....

Type of pump required.....

Special pipes required in addition to those to attach to the pump on suction and delivery.....

Reflux valve.....

Foot valve and strainer.....

Driving belts.....

Erection of engine and pumps complete where required to work on farm.....

Running the plant at full load for one week after erection, purchaser to pay for fuel, oil, etc.....

Tenders should be in detail for each item referred to in the schedule, and should specify fully in regard to each the nature and quality of the material tendered for.

With regard to the engine, full particulars should be given, maker's name, list size, etc.

The maximum brake horse power should be stated.

The consumption of fuel at full load or light. The kind of fuel to be used, etc., with estimate of cost of running the plant per day of twelve hours under the full load given in the schedule.



## The Purchase of Fertilisers.

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By G. N. BLACKSHAW, B.Sc., F.C.S.,  
Government Agricultural Chemist.

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During the past two years the use of fertilisers or artificial manures for crops other than tobacco has become so much more general in this Territory that the consumption thereof is rapidly increasing. In consequence of this, the brands of fertiliser on the market are becoming much more numerous, and as the price per ton is not the sole guide in determining the relative cheapness of the different brands, a few notes are here given upon the economical purchase of fertilisers for the guidance of buyers.

The three valuable manurial ingredients of fertilisers are nitrogen, phosphoric oxide and potash; some contain only one of these. Nitrate of soda and sulphate of ammonia are, for example, valuable as fertilisers solely for the nitrogen they contain, superphosphate for its content of phosphoric oxide, sulphate of potash for potash. Other fertilisers contain two of the three ingredients mentioned, whilst the compound fertilisers made up by manure merchants for special crops, by mixing two or more fertilisers together, and selling the mixture under names such as "Potato Fertiliser," "Complete Fertiliser," etc., contain as a rule all three ingredients.

Now, in all lines of commerce in which different grades of the same article are on the market, the price varies with the quality, and so with fertilisers the price per ton is naturally affected by the strength of the fertiliser, or, in other words, by the percentage amounts of the valuable manurial ingred-

ients present. In the purchase of fertilisers, therefore, the buyer must take into account not only the price per ton, but also the strength of the fertiliser. This being so, he must be furnished not only with the price of the fertiliser per ton, but also with a guarantee of the percentage amounts of the valuable manurial constituents.

In buying a fertiliser made up and sold under the trade name of, for instance, "Maize Fertiliser," how often are buyers guided solely by the price per ton, and led to think that they are buying in the cheapest market when the order is placed for the fertiliser quoted at the lowest figure. Those who fall into such an error do so more often than not because the guarantee which accompanies the fertiliser is not fully understood. This is not to be wondered at, however, for, with no Fertiliser Act in operation in this Territory, the method of expressing guarantees is not systematised; there is no particular form—fixed by regulation—which lays down the lines to be followed in stating the percentage amounts of manurial ingredients in the fertiliser. In consequence of this, the methods adopted in some cases are very crude, and the guarantee contains much that is unnecessary, serving to confuse rather than enlighten the buyer, unless he has made fertiliser guarantees a special study.

The amounts of valuable constituents in manures can be expressed in various ways, and, in the absence of regulations fixing the form, the systems of stating guarantees adopted by manure merchants naturally differ. Before, however, it is possible to satisfactorily ascertain the comparative values of two or more manures belonging to the same class, the guarantees have to be expressed in similar terms.

As already stated, the valuable constituents of fertilisers are nitrogen, phosphoric oxide and potash. In trade circulars these may be stated in the following terms:—

(1) Nitrogen as—

- (a) nitrogen;
- (b) ammonia;
- (c) sulphate of ammonia;
- (d) nitrate of soda,



## (2) Phosphoric oxide soluble in water as—

- (a) phosphoric oxide soluble in water, or phosphoric acid soluble in water;
- (b) “soluble” phosphate, or phosphate water soluble.

## (3) Phosphoric oxide insoluble in water as—

- (a) insoluble phosphoric oxide, or insoluble phosphoric acid;
- (b) insoluble phosphate, or undissolved phosphate;
- (c) tribasic phosphate of lime, or tricalcic phosphate.

## (4) Potash as—

- (a) potash;
- (b) sulphate of potash;
- (c) muriate of potash.

To convert the above forms of expression to a common basis of nitrogen, phosphoric oxide soluble in water, phosphoric oxide insoluble in water and potash, the following table supplies the necessary directions:—

| Amount of  | Divided by | Gives corresponding amount of |
|--|------------|-------------------------------|
| Ammonia, or “nitrogen equal to ammonia”  | 1.21       | Nitrogen                      |
| Sulphate of ammonia, or “nitrogen equal to sulphate of ammonia”  | 4.7        | do.                           |
| Nitrate of soda ... ..   | 6.07       | do.                           |
| Tribasic phosphate of lime, or tricalcic phosphate, or “soluble phosphate,” or phosphate water soluble, or water soluble phosphate of lime, or undissolved phosphate of lime | 2.18       | Phosphoric oxide              |
| Sulphate of potash ... ..  | 1.85       | Potash                        |
| Muriate of potash ... ..   | 1.58       | do.                           |

Another point in reference to the guarantees given in trade circulars is that the same constituent is often needlessly stated

in two or three forms, hence the origin of the expression, "packing the guarantee." The following guarantee is cited as an example:—

|   |     |     |     |     |               |
|---|-----|-----|-----|-----|---------------|
| Nitrogen                                  | ... | ... | ... | ... | 4.3 per cent. |
| Equal to ammonia                          | ... | ... | ... | ... | 5.2 ,,        |
| Equal to sulphate of ammonia              | ... | ... | ... | ... | 20.2 ,,       |
| Total phosphoric oxide                    | ... | ... | ... | ... | 12.2 ,,       |
| Equal to tribasic phosphate of lime       | ... | ... | ... | ... | 26.6 ,,       |
| Containing water soluble phosphoric oxide | ... | ... | ... | ... | 9.3 ,,        |
| Containing insoluble phosphoric oxide     | ... | ... | ... | ... | 2.9 ,,        |
| Potash                                    | ... | ... | ... | ... | 3.8 ,,        |
| Equal to sulphate of potash               | ... | ... | ... | ... | 7.0 ,,        |

Each manurial constituent, it will be noted, is expressed in more than one way, the nitrogen, for instance, being also given in its equivalent of ammonia and sulphate of ammonia. To be in the simplest possible form, and at the same time supply all the information there given, the above guarantee may be expressed as follows:—

|                                     |     |     |     |     |               |
|-------------------------------------|-----|-----|-----|-----|---------------|
| Nitrogen                            | ... | ... | ... | ... | 4.3 per cent. |
| Phosphoric oxide soluble in water   | ... | ... | ... | ... | 9.3 ,,        |
| Phosphoric oxide insoluble in water | ... | ... | ... | ... | 2.9 ,,        |
| Potash                              | ... | ... | ... | ... | 3.8 ,,        |

With a few people perhaps who do not give the guarantees a close study, the long string of figures in the original might conceivably create a more favourable impression than the simplified guarantee, yet the two forms convey exactly the same amount of information.

The regulations framed under the Fertilisers Act of the Cape of Good Hope require that the manufacturer of mixed fertilisers, sold under names such as "Tobacco Fertiliser," etc., shall not only give the percentage amounts of manurial constituents present, but also state the forms in which the nitrogen and potash exist in the mixture. The reason for this



is that nitrogen in some materials is not as valuable as it is in others for fertilising purposes; ground horn and ground hoof-parings, for example, have on occasions been used as the source of nitrogen in mixed fertilisers, but on account of the slow rate at which the nitrogen in these materials becomes soluble and available for the use of plants, it is of little value for quick-growing crops when compared with, for instance, the readily available nitrogen in nitrate of soda.

The source of potash, too, requires to be stated, because all forms of potash are not equally soluble; and, furthermore, some forms are not suitable for certain crops. To give an instance, muriate of potash should never be used for making up a tobacco fertiliser, for the reason that it has a harmful effect upon the burning quality of the leaf. Quotations for mixed fertilisers should, therefore, be accompanied not only by a statement of the percentage amounts of manurial ingredients in the fertiliser, but also by information as to the forms in which the nitrogen and potash are present, and if the buyer is in any way uncertain as to the suitability of these forms, he should refer the information to an authority for an expression of opinion.

Having considered the methods of stating guarantees, and the means by which they can be reduced to a common basis, we will now pass on to consider the question of valuation of fertilisers, and, in cases where two or more fertilisers on the market are equally well suited for his purpose, the means by which the buyer can determine the cheapest fertiliser or the best value in fertilisers for his money.

The unit system is one of the simplest and most satisfactory means of valuing fertilisers. In this method the unit is 20 lbs. or 1 per cent. of a ton (2,000 lbs.). To make this clear, let us take sulphate of potash as an example. This is quoted on the local market at £17 4s. 6d. per ton, with a guarantee that it contains 50 per cent. of potash. One ton, therefore, contains  $50 \times 20$  (1,000 lbs.) of potash, and as this fertiliser is valued solely for the potash it provides, the sum of £17 4s. 6d. is paid for 1,000 (or  $50 \times 20$ ) lbs. of potash. The cost of a unit of potash in this particular fertiliser is, therefore, £17 4s. 6d. divided by 50, which equals 6s. 10½d. Working

on similar lines with local quotations just to hand, the following values have been placed upon the units of nitrogen, phosphoric oxide (soluble and insoluble), and potash for the season 1913-14:—

|                                       | s. | d. |          |
|---------------------------------------|----|----|----------|
| Potash ... ..                         | 6  | 6  | per unit |
| Phosphoric oxide soluble in water ... | 7  | 0  | „        |
| Phosphoric oxide insoluble in water   | 4  | 6  | „        |
| Nitrogen ... ..                       | 22 | 6  | „        |

Examples illustrating the use of the above unit values in determining the cheapest fertiliser:—

*Example 1.*—Two superphosphates are quoted and guaranteed as follows:—

|                                     | A      | B       |
|-------------------------------------|--------|---------|
| Price per ton ... ..                | £8 9 6 | £15 4 6 |
| Guarantee—                          |        |         |
| Phosphoric oxide soluble in water   | 17     | 42      |
| Phosphoric oxide insoluble in water | 1      | 4       |

### Unit Valuation.

|                                     | A  |               | B  |                 |
|-------------------------------------|--|---------------|--|-----------------|
| Phosphoric oxide soluble in water   | 17 x 7/-   | £5 19 0       | 42 x 7/-   | £14 14 0        |
| Phosphoric oxide insoluble in water | 1 x 4/6  | 0 4 6         | 4 x 4/6  | 0 18 0          |
|                                     |  | <u>£6 3 6</u> |  | <u>£15 12 0</u> |
|                                     | Quotation  | £8 9 6        | Unit valuation                                   | £15 12 0        |
|                                     | Unit valuation                                   | 6 3 6         | Quotation  | 15 4 6          |
|                                     |  | <u>£2 6 0</u> |  | <u>£0 7 6</u>   |
|                                     | Amount by which quotation exceeds unit valuation | £2 6 0        | Amount by which unit valuation exceeds quotation | £0 7 6          |

*B* is, therefore, the cheaper fertiliser.



*Example 2.*—Two mixed fertilisers, quoted and guaranteed as follows:—

| <i>C</i>                            |     |     |      | <i>D</i>                            |     |     |     |
|-------------------------------------|-----|-----|------|-------------------------------------|-----|-----|-----|
| Price per ton (2,000 lbs.) £12 0 0  |     |     |      | Price per ton (2,000 lbs.) £13 10 0 |     |     |     |
| Guarantee—                          |     |     |      | Guarantee—                          |     |     |     |
| Ammonia                             | ... | ... | 3    | Nitrogen                            | ... | ... | 3.5 |
| Equal to sulphate of ammonia        | ... | ... | 14.1 | Water soluble phosphate of lime     | ... | ... | 32  |
| Total phosphoric acid               | ... | ... | 12   | Undissolved phosphate of lime       | ... | ... | 4   |
| Equal to tribasic phosphate of lime | ... | ... | 26.1 | Total phosphate of lime             | ... | ... | 36  |
| Containing phosphate water soluble  | ... | ... | 22   | Potash                              | ... | ... | 5   |
| Potash                              | ... | ... | 3    |                                     |     |     |     |
| Equal to sulphate of potash         | ... | ... | 5.5  |                                     |     |     |     |

First reduce these guarantees to a common basis by the method already explained.

| Nitrogen ...                            |     |     |                        | Nitrogen ...                            |     |     |                          |
|---|-----|-----|------------------------|---|-----|-----|--------------------------|
|   | ... | ... | 3                      |   | ... | ... | 3.5                      |
|   |     |     | $\frac{3}{1.21} = 2.4$ |   |     |     |                          |
| Phosphoric oxide soluble in water ...   |     |     |                        | Phosphoric oxide soluble in water ...   |     |     |                          |
|   | ... | ... | 22                     |   | ... | ... | 32                       |
|   |     |     | $\frac{22}{2.18} = 10$ |   |     |     | $\frac{32}{2.18} = 14.6$ |
| Phosphoric oxide insoluble in water ... |     |     |                        | Phosphoric oxide insoluble in water ... |     |     |                          |
|   | ... | ... | 12                     |   | ... | ... | 4                        |
|   |     |     | $12 - 10 = 2$          |   |     |     | $\frac{4}{2.18} = 1.8$   |
| Potash ...                              |     |     |                        | Potash ...                              |     |     |                          |
|   | ... | ... | 3                      |   | ... | ... | 5                        |

*Unit Valuation of C and D.*

| <i>C</i>                                    |     |     |         | <i>D</i>             |  |  |  |
|---|-----|-----|---------|----------------------|--|--|--|
| Nitrogen...                                 |     |     |         | 3.5 × 22/6 = £3 18 9 |  |  |  |
| Phosphoric oxide soluble in water ...       |     |     |         | 14.6 × 7/- = 5 2 2   |  |  |  |
|   | ... | ... | 10      |                      |  |  |  |
| Phosphoric oxide insoluble in water ...     |     |     |         | 1.8 × 4/6 = 0 8 1    |  |  |  |
|   | ... | ... | 2       |                      |  |  |  |
| Potash ...                                  |     |     |         | 5 × 6/6 = 1 12 6     |  |  |  |
|   | ... | ... | 3       |                      |  |  |  |
| Valuation per ton                           |     |     |         | £11 1 6              |  |  |  |
|   |     |     | £7 12 6 |                      |  |  |  |
| Quotation ...                               |     |     |         | £13 10 0             |  |  |  |
|   | ... | ... | £12 0 0 |                      |  |  |  |
| Unit valuation                              |     |     |         | 11 1 6               |  |  |  |
|   | ... | ... | 7 12 6  |                      |  |  |  |
| Amount by which quotation exceeds valuation |     |     |         | £2 8 6               |  |  |  |
|   | ... | ... | £4 7 6  |                      |  |  |  |

From the simplified method of expressing the guarantees, it will be seen that there is not a wide difference between the *relative* proportions of nitrogen, phosphoric oxide and potash in the two mixtures, 300 lbs. of *C* supplying approximately the same amounts of these ingredients as 200 lbs. of *D*, and the sum by which the quotation exceeds the unit valuation being least in the case of *D*, this is the cheaper of the two fertilisers.

Owing to the cost of importation, it will be invariably found that the more concentrated the fertiliser, the cheaper is the unit of fertilising ingredient which it contains, consequently the values assigned to the units of nitrogen, phosphoric oxide and potash are based on the prices ruling for the most concentrated fertilisers.

Of the mixed fertilisers, the valuation of "double complete" fertiliser, commonly used by tobacco growers to-day, which is sold under the guarantee:—

|    |           |                                      |
|----|-----------|--------------------------------------|
| 8  | per cent. | nitrogen;                            |
| 20 | „         | phosphoric oxide soluble in water;   |
| 4  | „         | phosphoric oxide insoluble in water; |
| 10 | „         | potash;                              |

will shew that there is very little difference between the unit valuation and the cash quotation per ton.

In the less concentrated fertilisers, however, the quotation will, as a rule, exceed the unit valuation, for the reason that the unit values, as already mentioned, are based upon the cost of concentrated fertilisers, thereby reducing freight per unit of fertilising ingredient to a minimum.



## Hints on Brickmaking.

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By G. T. DYKE.

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Having had some practical experience in the manufacture of bricks, and having seen Staffordshire blues, Adderley Park reds, Stourbridge fire bricks, and Ruabon terra cotta made by hand and also by the most up-to-date machinery, as well as thousands of bricks made in the Transvaal, I am perhaps able to give a few hints to those who desire to make bricks for their own use.

First, I would impress upon all who intend making bricks that success in brickmaking, like everything else, largely depends on the maker being thorough in every detail from start to finish. I mention this, as I have seen more than one failure through lack of interest and the leaving of all the work in the hands of kafirs.

The prevailing idea of the amateur in this country is to make his bricks of antheap. Good bricks can be made from this material, but when a large quantity is required, one cannot go to the expense of carting antheap, or making bricks wherever the antheaps happen to be. Both in this country and in the Transvaal I have found yellow clayey sub-soil to be the best material for the manufacture of bricks, and I believe there are very few farms on which it is not to be found. In no case should the top soil be used, as the bricks are sure to crack if it is. To good yellow sub-soil should be added clean, sharp sand: ratio, three parts sub-soil to one part sand. I have found sand from the mines to be excellent. Particular care and attention should be given to the mixing and puddling of the material.

Excavate one hole in the ground 2 ft. deep x 12 ft. x 6 ft. wide, with one sheet of galvanised iron on edge across centre, placed in such a manner as to form two equal compartments, each 2 ft. x 6 ft. x 6 ft. Mix the dry sub-soil and sand at the side of the holes before adding water, and when well mixed put into the holes and add water as required. Put two boys to stamp it into a thick pasty mass, always remembering you cannot puddle it too much. Have a good strong deal table made, 12 ft. x 4 ft. x 2 ft. 4 in. high, and place same at the edge of the hole, so that the clay, as we will now call it, can be readily placed on the back of the table with a shovel; always keep the top of the table wet when making.

**MOULDS.**—These can be best made of well-seasoned floor boards, large enough to hold three bricks. The inside measurement of each mould should be  $9\frac{1}{4}$  in. long,  $4\frac{5}{8}$  in. wide, by  $3\frac{1}{8}$  in. deep, which size allows for shrinkage in drying and burning. The finished brick will be 9 in. x  $4\frac{1}{2}$  in. x 3 in.; the moulds should be very smooth on the inside, quite square at the corners, and parallel from top to bottom. I should advise anyone who is not a good hand at carpentering to have the moulds made by a competent workman. A galvanised iron tank or ordinary bath should be placed at each end of the table, as shewn in diagram, and kept well filled with water, into which the moulds are put as the carriers bring them back after depositing the bricks on the drying floor. A large space should be cleared on which to deposit the bricks when made, and great care must be taken to have the surface level and smooth, otherwise good-shaped bricks cannot be expected. Supposing these preparations to have been made, we are now in a position to commence making the bricks.

Two boys can work at a table of the dimensions given. The clay in hole No. 1, being ready for use, is dumped on the table; each moulder takes a set of moulds from the water tank, dusts them with fine sand, then takes a portion of the clay and slaps it into the moulds, taking care to ram it into the corners. Next draw a straight edge across the top, and the mould is then ready for the carrier to take away to the depositing site.



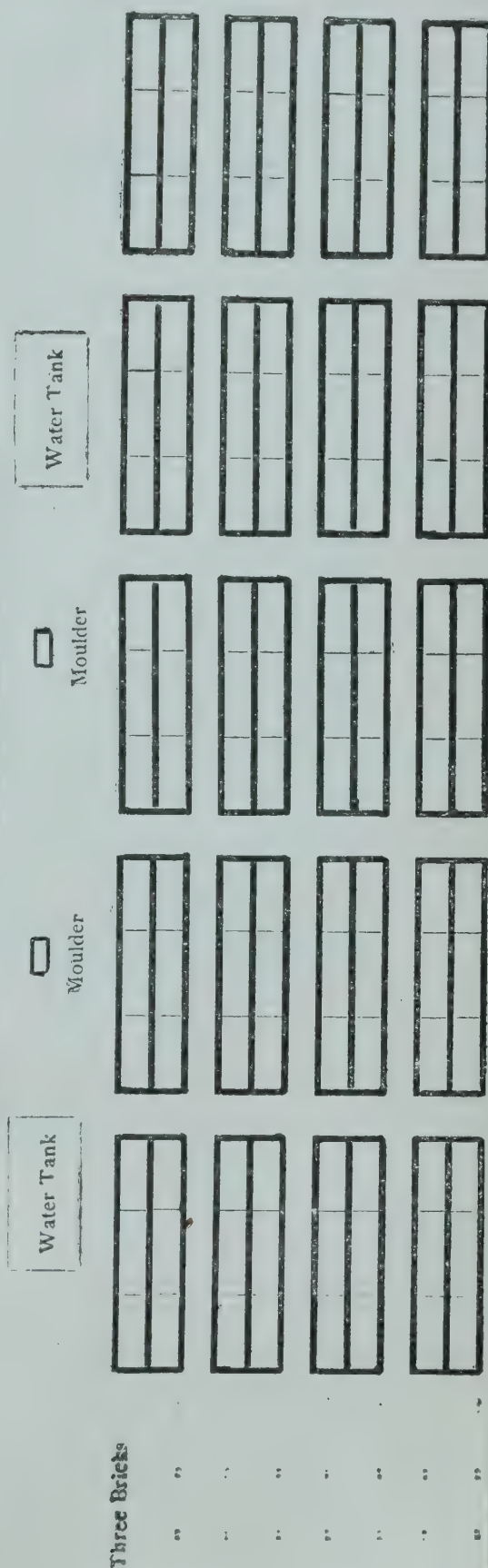
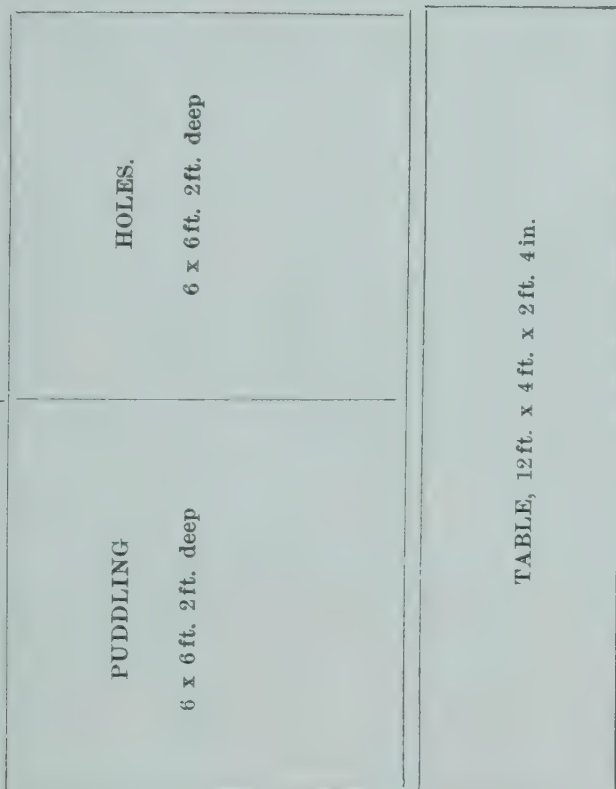
Each moulder should have two boys to carry the moulds away. When the mould is filled with clay, the carrier should run with it to the drying ground and deposit the bricks by carefully turning the mould upside down, and then return and put the mould into the water tank, by which time another mould should be ready for him to deal with in the same manner. When the boys have once got used to the work, two makers should easily turn out 1,000 bricks per day.

After the bricks are laid on the drying floor, they should be lightly covered with grass or straw. Each day's work will be ready to stack the following morning. The bricks should be stacked on edge with a small space between each brick so that a current of air can pass through and assist the drying process. The stacks should be turned at the end of three days, and in six days should be ready for burning. Care should be taken to put a covering of grass or straw over the stacks to keep off the direct rays of the sun, otherwise the bricks will crack. *Re* method of placing bricks on drying ground, puddling holes, table and tanks, see sketch.

The following are the chief points to be observed:—

- (a) Good yellow sub-soil mixed with sand, three to one.
- (b) The more the clay is puddled the better the brick.
- (c) An addition of fine sifted wood ash improves the brick.
- (d) In no case should any gravel or stones be mixed with the clay.
- (e) Moulds to be put into water tanks every time after removing brick.
- (f) Dusting moulds with fine sand ensures bricks leaving readily.
- (g) Bricks must be covered with grass or straw to prevent sun from cracking them.
- (h) A clean, level depositing site ensures a good shape.
- (i) Puddle fresh clay in one hole, while using mixed clay from the other.

GALVANISED IRON PARTITION



Three Bricks

" "

" "

" "

" "

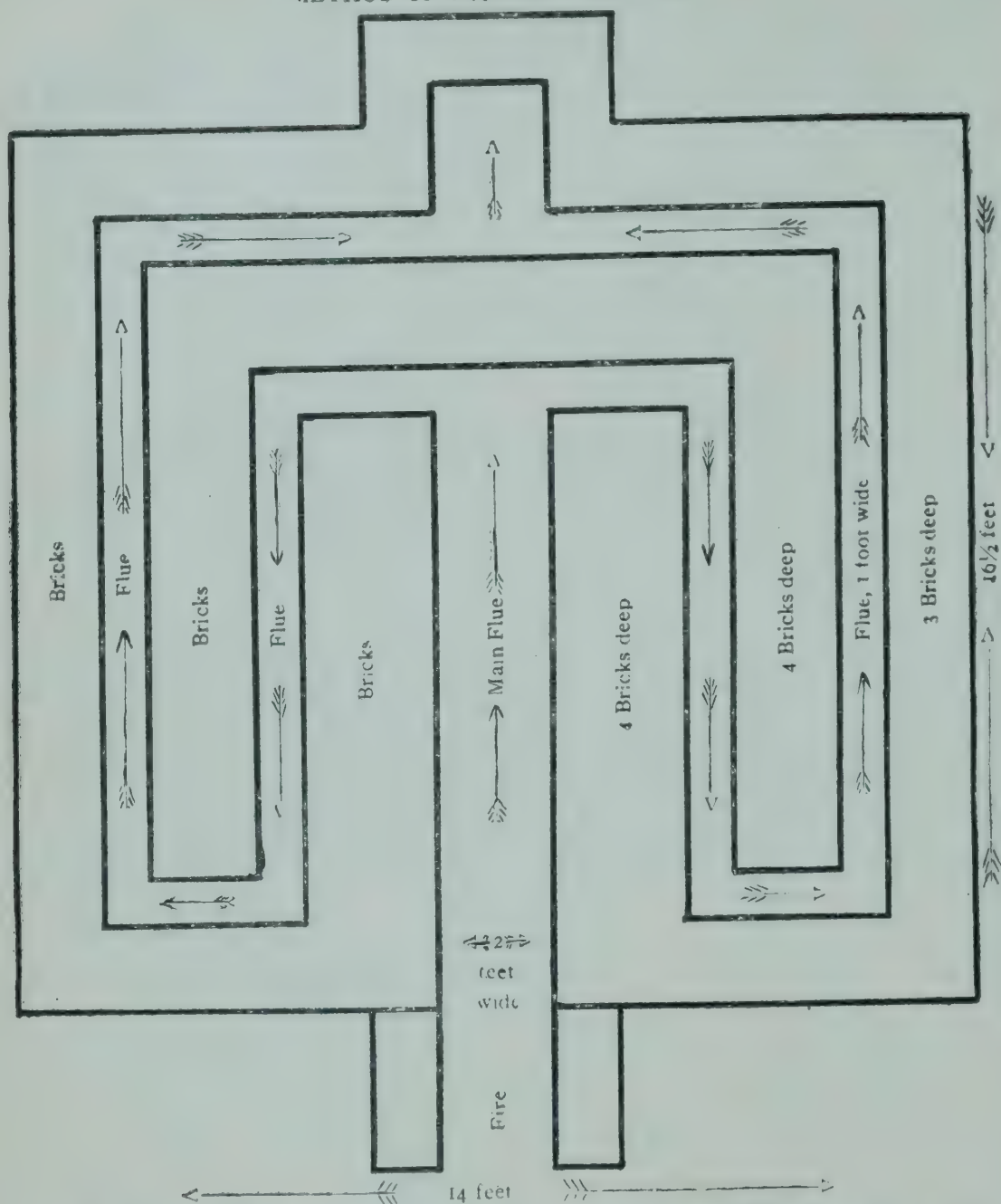
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# METHOD OF BUILDING THE KILN



A kiln of the dimensions shewn and 9 feet high will hold 25,000 bricks if properly packed. Bricks should not touch in stacking, except, of course, on the flat side. Well cover the outside of kiln with dagga before firing. Cover the top of the kiln with old corrugated iron, and cover this again with about 4 inches thick of dagga. Burn with a steady wood fire for three days and nights, then stop up all flues and fire place, and in three days the kiln will be ready to open. Six days or more will then be required before the bricks will be sufficiently cool to take out.

Great care must be taken throughout the whole process until the bricks are in the kiln, to prevent rain falling upon them, and for this reason brickmaking is an operation for the dry season.

## Two Ladybirds Injurious to Potato Plants.

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By RUPERT W. JACK, F.F.S., Government Entomologist.

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Few insects bear a better character amongst the farming community than the ladybirds, and with the great majority of species there are few insects more deserving of encouragement, as without their aid scale insects and plant lice would be troubles far more potent for injury than they are at present. There is, however, one genus of ladybirds of which all the known species are exclusively plant-feeders, rendering the farmer no service, but levying a toll upon his crops. This is the genus *Epilachna*, and in Southern Rhodesia there are two species, *E. dregei* and *E. hirta*, which, normally feeding on certain wild species of solanaceous plants, have developed a taste for the potato and evinced a capacity for damage of a serious, though not as a rule overwhelming, nature. During the past season, *E. dregei* has been noticeably abundant in the neighbourhood of Salisbury, whilst *E. hirta* has been equally injurious about Umtali. Seeing that both species are generally distributed throughout South Africa, it is curious to note that all cases of injury near Umtali during the past season have been due to *E. hirta*, and all near Salisbury due to *E. dregei*. *E. hirta* is common about Salisbury, but has not so far been recorded as a pest there.

The eggs are yellowish in colour, and laid in clumps of varying number on the under surface of the leaves. The long axis of each egg points towards the leaf, and each is firmly glued to the leaf and to its neighbours (see Fig. 7 on the plate). The eggs measure about one and a half millimetres (rather under one-sixteenth of an inch) in length, and are about twice as long as they are broad. The clumps vary from four or five



eggs to upwards of thirty. The eggs in both species hatch in from four to five days. The larvæ are yellow, spiny grubs, but the two species differ considerably, those of *Dregei* attaining a larger growth, bearing longer and darker spines with less uniform branches. The larvæ of *Hirta* have a much more compact appearance, and are far yellower. *Dregei* larvæ attain a maximum length of about 10 millimetres (rather over three-eighths of an inch) excluding the spines, those of *Hirta* not exceeding 8 millimetres (about five-sixteenths of an inch). Under cage conditions the larvæ of *Dregei* began to pupate on the 25th day after hatching, those of *Hirta* commencing on the 28th day. When about to pupate, the grubs attach themselves by the anal end to the surface of the leaf and become motionless. A little later the larval skin splits and is shed backwards, but remains covering the posterior end of the pupa.

Apart from the greater size and darker colour of *Dregei*, the difference in the appearance of the pupæ, which may be seen by reference to the plate (Figs. 2 and 5), is chiefly caused by the presence of the larval skins. The pupal stage in both species occupies five to six days. The newly emerged adults are soft and of a creamy colour, the darker markings gradually appearing in smoky outline. They attain their full colouring and harden within an hour or two. The adults of the two species are about the same size, but, apart from the different distribution of the spots, differ in the following particulars:—*E. hirta* is more acute posteriorly and more prominent in the "shoulders"; the light spots are red, whilst the thorax, head and legs are dark. The wing covers, etc., are covered with a light pubescence giving the insect a dusty appearance. The spots, thorax, head and legs of *Dregei* are usually yellow, sometimes reddish, but never as dark as the spots of *Hirta*. The insect is of rounder form, and the pubescence on the wing covers, etc., is not noticeable.

The habits of these insects are of the simplest nature, as in all stages the insect lives on the foliage of its food-plants. The eggs are generally attached to the under-sides of the leaves, and this is also a favourite position of the larvæ. The larvæ devour the surface and softer portions of the leaves, leaving the veins and cross-veins intact. Their work has thus a characteristic appearance, as may be seen at Fig. 8 on the

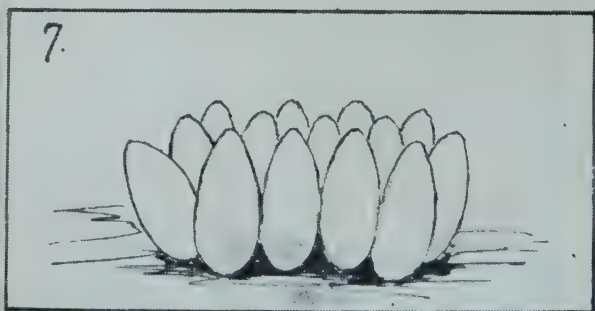
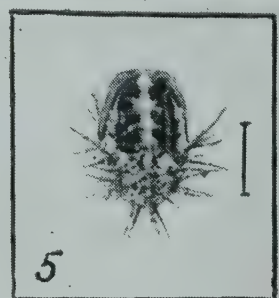






plate. The pupæ appear to be practically always attached to the under surface. The adults feed on the foliage, and their work is not dissimilar to that of the larvæ, their appetites being almost as voracious. In the warm sunshine the beetles fly about actively, and in March, 1910, the writer saw thousands of *E. dregei* beetles on the top of Salisbury Kopje, flying around in every direction, and settling on the wild herbage. Such a congregation of individuals has not yet been recorded from a potato field in this country, but demonstrates the fact that under favourable conditions this pest is capable of great increase, and it is likely that occasional instances of very serious injury to extensive plantings of potatoes may occur. The natural food-plants of these ladybirds are the wild species of *Solanum* and allied plants, in which the flora of South Africa is rich. Amongst cultivated plants the potato is the only species to which the ladybirds have been found to be injurious, but the writer has seen an occasional adult indubitably feeding on vegetable marrow foliage.

PREVALENCE AND INJURIES INFLICTED.—The months of January and February mark the height of the season for these insects, but injuries from *E. hirta* have been reported in December near Umtali, whilst farmers near Salisbury state that ladybirds (species not distinguished) are injurious as early as October or November, and that young are present in the latter month. This is on early potatoes grown under irrigation. The adult ladybirds live over the winter without breeding, and probably egg-laying commences as soon as the weather becomes warmer and suitable food-plants are available. As shewn above, the development of *E. dregei* from egg to adult may take as little as thirty-four days, and *E. hirta* as little as thirty-seven days. The breeding season is, however, short, as adults bred out and collected about the first week in March settled down to over-winter, feeding freely enough, but refusing to lay eggs. About this time late potatoes in gardens, where the earlier crops suffered severely from attack, shewed no trace of larvæ or eggs. This early cessation of breeding activity is characteristic of other species of this injurious genus in other countries. Normally it is probable that only two broods develop on the potato crop in this Territory, the eggs of the first being laid late in December, the adults appearing about the end of January and the beginning of February.



The second brood matures early in March. If early potatoes are available in November, however, there is little doubt that three broods are able to mature, and on farms where early potatoes are grown under irrigation, or in kitchen gardens, the pest gets a much better start than it does on the main crop alone, as grown under normal rainfall. This early start results in considerable increase and corresponding severity of injury, for the over-wintering adults, as can be readily understood, are exposed to many dangers during the long period when no reproduction takes place, and by the time food plants are again available their numbers have been reduced to a fraction of what they were at the end of the preceding season. If reproduction can commence in October or November on an abundant and easily available food supply, such as a field of potatoes, the following broods are likely to be numerous.

Small plantings in kitchen gardens are frequently completely destroyed by these ladybirds. Overwhelming injury to field crops has not been observed, but quite serious damage to crops up to five acres in extent may occur under favourable conditions as mentioned above. In addition to the damage caused by the feeding of the ladybirds and their larvæ, there is little doubt that, as in the case of the notorious Colorado potato beetle in America, potato diseases are spread and assisted by these insects, more especially the extremely destructive early blight (*Alternaria solani*) in this Territory.

One farmer reports that turkeys are very effective in destroying these pests in the field. These birds need to be educated in the work to produce the maximum effect, but, when experienced, they are indefatigable in searching for their insect food, and, fattening on the farmer's foes, render the use of insecticides unnecessary.

Much good can be accomplished in kitchen gardens by setting natives to destroy the beetles by hand, but when potatoes are grown on even a moderate scale, spraying with an arsenical compound is certainly the most effective remedy. The arsenic may take the form of arsenate of lead, 3 lbs. to 50 gallons of water, or Paris green 1 lb., quick or fresh water-slaked lime 2 lbs., water 100 gallons; or arsenite of lime. For those who are prepared to take a small amount of trouble, to save money arsenite of lime is by far the cheapest arsenical

spray available in this Territory, and is quite as effective as either arsenate of lead or Paris green, and has intrinsic advantages over the latter. Arsenite of lime can be prepared from arsenite of soda and quick or water-slaked lime. The formula is as follows:—

Arsenite of soda, 4 ozs.

Quick or fresh water-slaked lime, 11 lbs.

Water, 50 gallons.

To obtain the best precipitate, the ingredients should be prepared in two barrels containing 25 gallons each. The arsenite of soda is best dissolved in a little boiling water, as it dissolves but slowly in cold water, and made up to 25 gallons in one barrel. The lime is then slowly slaked (if necessary), made up to a smooth paste with a little water, and stirred thoroughly into the 25 gallons of water in the second barrel. It can be stirred at intervals for half an hour or so. The arsenite solution can now be added to the lime water, and the whole stirred thoroughly. The combination takes place very quickly, and in the repeated tests made at the Agricultural Laboratories the re-action was always found to be complete at the end of one minute. The ingredients may, of course, be mixed in smaller quantities of water than given above, and water added later to bring the mixture to the correct strength for use, but it is a well-known fact that the more dilute the solutions, mixed to form an insoluble compound, the finer are the particles of which the compound is formed, and a fine precipitate has great advantages over a coarse one for spraying purposes, as it remains much better in suspension in the tank and sticks better to the foliage. However, if only two gallons of each solution prepared as above are mixed to fill a paraffin tin, the precipitate is a good one. Care should be taken that the lime is of good quality, and the lime solution should as a rule be strained through a piece of cloth to remove any grit, which, if present in the spray pump, is likely to clog the nozzles, as well as to cause undue wear to the pump.

To compare the cost of arsenite of lime with arsenate of lead, a hundred gallons of the latter mixture at effective strength calls for 6 lbs. of the chemical, which at 1s. 3d. per lb. makes 7s. 6d. One hundred gallons of arsenite of lime to be effective calls for about  $\frac{1}{2}$  lb. arsenite of soda at 1s. per lb. and



22 lbs. quicklime at 9s. per bag of about 150 lbs., giving a total of about 8d. The above formula provides a very great excess of lime, which has the advantage of rendering the mixture a safe one to use with very ordinary care in preparation. The mixture should be kept stirred during use, though it does not call for the same constant agitation as Paris green. A mechanical agitator is provided with many knapsack pumps, and is an advantage.

#### EXPLANATION OF PLATE.

- Fig. 1.—*Epilachna hirta*—adult—enlarged.
- Fig. 2.—Do., pupa—enlarged.
- Fig. 3.—Do., larva—enlarged.
- Fig. 4.—*Epilachna dregei*—adult—enlarged.
- Fig. 5.—Do., pupa—enlarged.
- Fig. 6.—Do., larva—enlarged.

The actual sizes of the above are shewn by the hairline drawn adjacent to each insect.

- Fig. 7.—Eggs of *E. hirta*—very greatly enlarged.
- Fig. 8.—Potato foliage shewing characteristic injury by *E. dregei*.

# Notes on Cattle Breeding.

## PART III.

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By R. C. SIMMONS.

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**DAIRY AND GENERAL PURPOSE BREEDS.**—The majority of so-called dairy breeds are to a greater or lesser extent dual purpose animals, but some of their number may more properly be looked upon as uneconomical except for purely dairy purposes. The consideration of this subject will be facilitated if we begin by taking the most extreme type of dairy breed as represented by the Jersey, a perfect illustration of which is reproduced with this article. Upon examination of the illustration it will be seen that the cow is, as it were, a machine built exclusively for the purpose of bearing a calf and producing large quantities of rich milk. Everything about the machine points to these objects. The rather fine and dished face, large mouth and nostrils, mild but active eye, active thin ears, long lean neck, large roomy abdomen, wide pelvic region, well-developed milk-producing organs, and prominent spinal cord, all indicate highly organised but controlled nerve power, sound digestive and reproductive abilities, as well as space to carry the large quantities of food which a heavy milker must necessarily consume. The cow in the illustration is in the pink of condition, yet it will be observed that she carries scarcely a pound of spare flesh. Her frame is not a suitable one on which to build up a solid, square, beef carcass. It is not the writer's purpose to deal now with the relative points of beef and milch cattle; it will suffice to say that the various breeds of cattle may be classed respectively as pure dairy, dual purpose, or beef animals in exact ratio as they resemble the Jersey type or recede from it towards the beef type as represented, say, by the Aberdeen Angus.



**JERSEY CATTLE.**—The Jersey cannot be recommended as a breed for Southern Rhodesia except for purely dairy purposes. Notwithstanding the fact that it originated in low-lying and insular countries, it is found to be fairly hardy in many high inland parts. It is noted for richness of milk, combined to a great extent with quantity, but in England herds composed solely of Jerseys are seldom found, except on private estates and the like, where the financial aspect of the question is not of the first importance. In herds which are kept for the purpose of butter-making, a few Jerseys are sometimes kept to improve the colour of the butter. The flesh of the Jersey bullock, even though the animal may be outwardly of most satisfactory appearance, is considered in the meat trade to be very third rate. The breed is not one calculated to put size and shape on our native stock, and should not be used as a cross unless all profits from beef can be dispensed with.

The Jersey should be whole coloured, varying from light fawn to almost black, with orange markings on the back and middle piece. A few white markings (being, as a rule, a throw-back to a former colouring of the breed) need not be regarded as indicating impurity of blood. Whatever the colour of the hair, the skin should be yellow, especially on the ears, teats and udder.

The illustration produced with this number represents the true type. It should be noted that the terms "Jersey" and "Alderney" are now synonymous, and refer to one and the same breed. The term "Alderney" is gradually dropping into disuse.

**AYRSHIRE CATTLE.**—The Ayrshire is perhaps of all the better known breeds nearest to the Jersey type, but is not nearly so extreme a type. It is distinctly a milk breed, but has a more compact and regular frame. It is noted for great hardiness, and for the production of considerable quantities of milk of moderate quality as regards butter fat. This breed, then, is admirably suited for dairies where whole milk or cheese is the chief aim. Its flesh, unlike that of the Jersey, is good. It cannot claim to be a beef breed, but the oxen fatten readily, and its crosses with some beef breeds make quite useful dual purpose animals. The Ayrshire has been extensively used in Australia, crossed with milking Shorthorns, to form a highly developed dairy strain of Shorthorn type, known as Illawarra

cattle. Its effect on the Shorthorn has been to improve the milking qualities at the expense of the beef carcass, so far as weight and shape are concerned. It is not calculated to improve the shape or size of our native cattle, but it may be found useful on Colonial cattle of Shorthorn type when it is sought to produce purely dairy animals.

1. Head: Short, forehead white; horns wide-set and inclining upwards.

2. Neck: Moderately long, and straight from the head to the top of the shoulder, free from loose skin on the under side, and enlarging symmetrically towards the shoulder.

3. Barrel: Forequarters light, with sufficient chest room to ensure constitution, gradually increasing in depth and width backwards.

4. Back: Short and straight, spine well defined, especially at the shoulders; ribs short and arched.

5. Hindquarters: Long, broad and straight, hook bones wide apart, thighs deep and broad and free from superfluous flesh; tail long and slender and level with back.

6. Udder: Capacious, not fleshy, hind part broad and rounded, the whole firmly attached to the body; teats 2 in. to 2½ in. long, equal in thickness, and hanging perpendicularly.

7. Legs: Short in proportion to size, bones fine.

8. Skin: Soft and elastic, covered with close, woolly hair.

9. Colour: Red, of any shade; brown or white, or a mixture of these; each colour being distinctly defined.

FRIESLAND CATTLE.—Next in order comes the Friesland. At the risk of incurring flat contradiction, if not displeasure, in many quarters, the writer feels bound to place the South African Friesland amongst the distinctly milk breeds. There are heavier types of Frieslands more inclining to beef qualities, but these, as a rule, are not suited to South African conditions. It must be admitted that a slight touch of Friesland blood in our native cattle has been responsible for a marked improvement from a beef point of view, by reason of the fact that it has improved the shape, size and make of the frame, and has somewhat increased the milk production, thus rendering the cross-bred Fries-Native cow more able to bear and rear a big



calf. Notwithstanding this, it is most noticeable that any amount of Friesland blood in an ox, over and above what may be described as a slight touch, has the effect of impairing the quality of the meat. At the present moment the writer is aware that, within limits, the quality of the meat as compared with weight is not an important matter, but the time is rapidly approaching when the buyer of slaughter cattle will discriminate between really first-class and second-rate carcasses. The Friesland, being a milk breed, has not, in any marked degree, those early maturing qualities which are now-a-days looked for in beef animals, a fact which somewhat discounts any increase in weight, since more food is required to produce a given weight. As a dairyman's or milk vendor's cow, it is doubtful if we have any more profitable breed in South Africa than the Friesland, except perhaps in a few special localities which, for one reason or another, do not seem to suit it. As butter producers, this breed has been much improved of late years, and its better crosses often give milk of good average quality as well as quantity. Frieslands will thrive as a rule wherever fairly sweet, sheltered veld is available, and an ample supply of winter feed can be provided for any animals that are in milk or heavy in calf during the winter months. A detailed description of the Friesland is not necessary, as nearly all South African farmers are familiar with the type. The following points, however, may with advantage be noted:—

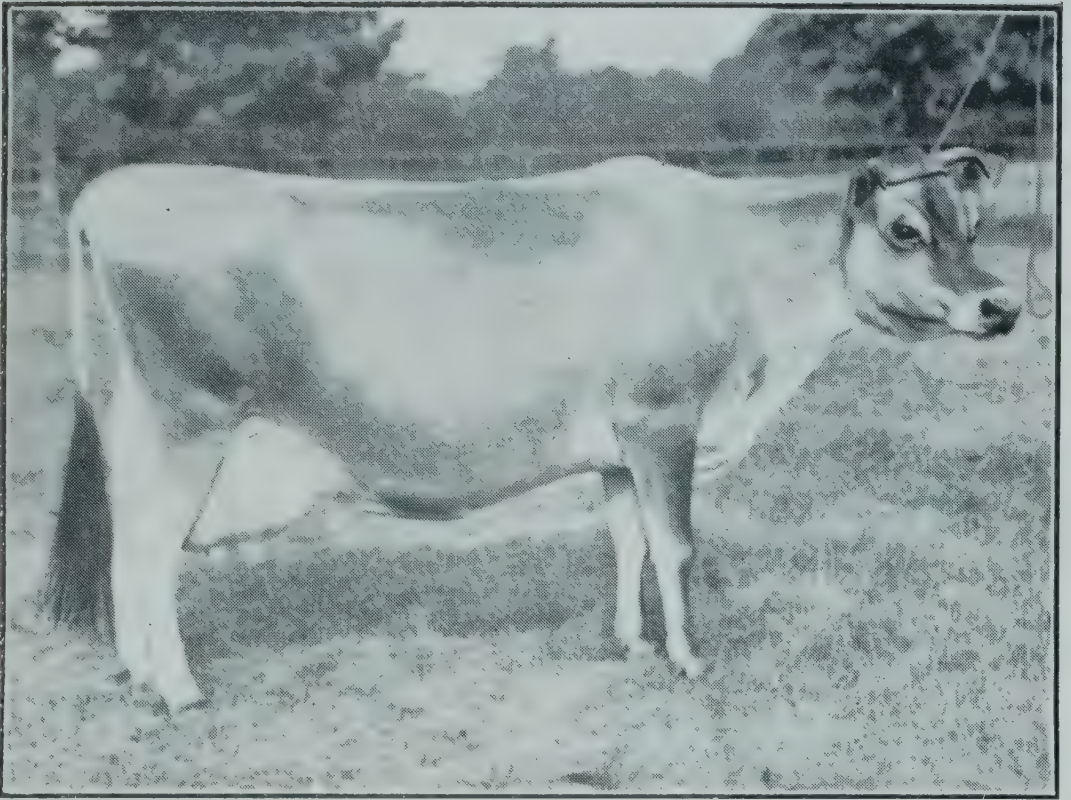
**Colour:** Black and white, either with black or white predominating or about evenly distributed. In all pure-bred animals the black and white markings are sharply defined: in no case do they merge gradually into one another, or occur as small spots, such as are commonly described as "tick marks."

The hair should be fine and silky upon a medium thick, mellow skin.

The horns should be small, fine, usually in-curving, and white with black tips.

The ears should be large, thin, quick in movement, and usually fringed with black hair.

The cows should be of a typically dairy wedge-shape, but big and roomy in frame. Bulls incline more to the beef type as a rule, but the present-day bulls of extreme milking pedigree have lost many of their former beef characteristics.



Jersey Cow—an extreme type of highly specialised milking animal.



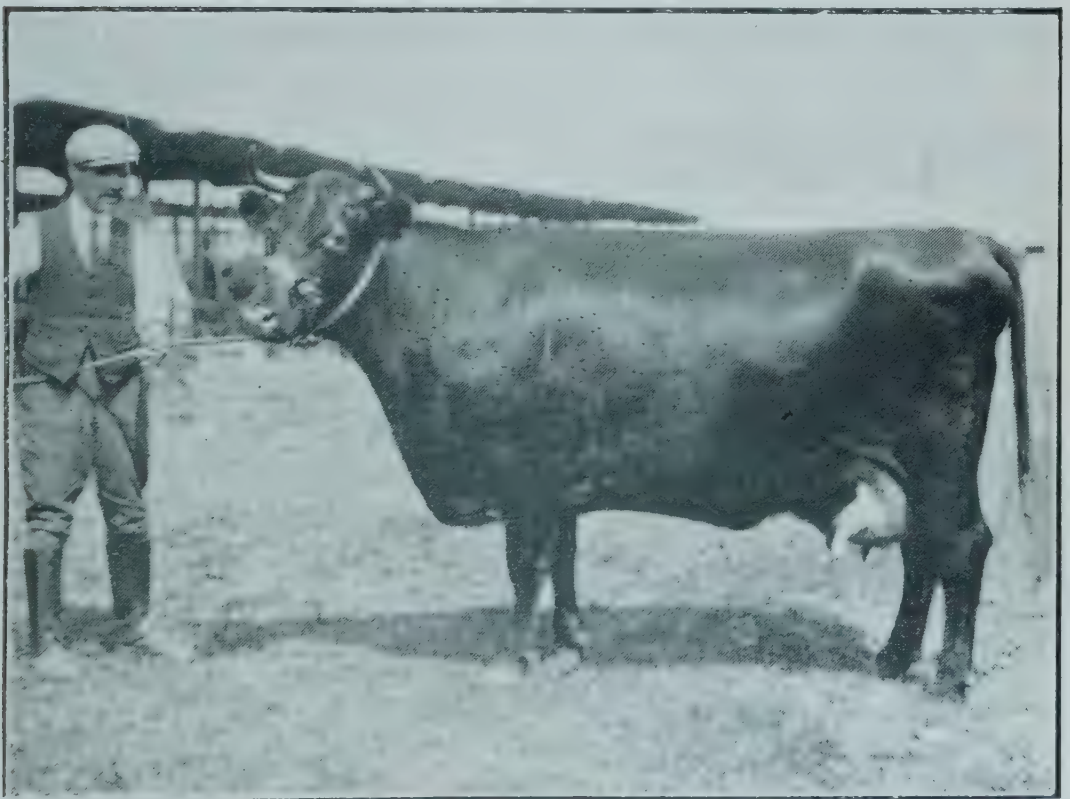
A Shorthorn beef heifer—a type giving as much beef as is consistent with fair milking qualities.







An extreme type of milking Shorthorn. (The similarity to the Jersey conformation will be noticed.)



A good type of Red Lincoln cow, whose beef and milking qualities are about equal.





**DUAL PURPOSE BREEDS.**—The Shorthorn (Coates), Lincoln Red, North and South Devon, and the Red Polled, may be regarded as dual purpose animals. That is to say, strains of all these breeds are obtainable which have been bred for a length of time with the object of giving as much milk as is consistent with the production of a fairly early maturing and useful beef carcass.

**THE SHORTHORN.**—Referring again to the first part of these notes, which appeared in the December, 1912, number of this Journal, a description of the various strains of Coates Shorthorns will there be found. As regards colour, markings, and general characteristics, the same remarks apply to the dairy strains as to the beef types. It must, however, be remembered that when the Shorthorn is kept on a farm for dairy purposes a much more intensive system of farming is necessarily implied than would be the case in a ranching proposition. The breed may, therefore, thrive for dairy purposes in many localities in which it would be too soft as a rancher. It is noticeable that a large majority of the cows kept in commercial dairies in England, except perhaps in the south-west and east, are Shorthorn or of Shorthorn type, and it may be inferred that, provided they get sufficient food and attention, they are about the best all-round dual purpose cattle we have. In recent years the various strains of Shorthorns have been to some extent over-specialised, with the result that the extreme milking strains are almost as unsuitable for beef as Frieslands. On the other hand, the extreme beef types are very poor milkers indeed. The older types of Booth and Bates cattle can still be procured, and are real dual purpose animals. We are assured by the most prominent breeder of the Red Lincoln Shorthorn, which was formerly bred largely for milk, that more attention has lately been given to its beef qualities. In using the Shorthorn as an improving bull on our local herds, it is perhaps necessary, more so than with any other breed, to enquire into the ancestry of the bull. For instance, if one wanted to produce good dual purpose cattle from our native stock, one would look for a bull, himself of good shape and make, and out of a cow of known good milking capabilities. Should the bull's dam have been a poor milker, it is probable that his progeny will be wanting in that respect, and tend towards the more purely beef type.



THE SOUTH DEVON.—The South Devon claims to be the biggest breed in England, and one of the best dual purpose animals. It has not yet been tested in Rhodesia, but several head have lately been brought into the country, and no doubt some reliable data with regard to their suitability will be forthcoming in a year or two. In the meantime the writer would caution prospective buyers to consider whether or not it is wise to bring an admittedly large-framed breed, reared on the best and richest pastures in England, into a country like Rhodesia, unless a very intensive system of farming is to be undertaken. The South Devon has been extensively boomed in the Free State. Some very competent judges who have seen the breed in that Province are by no means impressed with its suitability for this country, and it would seem wise to guard against being possibly led astray by the perfectly commendable and legitimate but very energetic advertising of the South Devon by the Home breeders.

South Devons are large-framed cattle. The cows resemble very much the Shorthorn type, and the bulls incline rather to the Sussex in shape, but are more finished. The colour is all-red, except for a little white on the udder of the cow and scrotum of the bulls, and a white brush to the tail. Having been formed from the North Devon by crosses of Channel Island and other breeds, the colour is not always so distinctive as that of North Devons, and is at times yellower. In general appearance they are an even blend of the beef and dairy types.

THE NORTH DEVON.—One type of this breed has already been described in the first part of these notes (*Agricultural Journal*, December, 1912). What is known as the Somersetshire type of the same breed may be described as a general-purpose animal. It has been evolved from its somewhat smaller and more compact relative of the moors by a system of selection and higher feeding on the richer lands of the Somersetshire and south Devon farms. It gives a considerable quantity of rich milk, and is hardy and thrifty. The oxen fatten well, and produce an excellent carcass, both in quality and shape. Although really one of the smallest of English breeds, it carries a big body on short legs. It would appear to be the right type of animal for the colder and more hilly parts; at the same time it responds to good feeding very satisfactorily.

indeed. It crosses well with native, Africander or Shorthorn types, but the few examples the writer has seen of Devon-Friesland crosses are not promising. When purchasing this breed for dairy or general purposes, care should be taken to get the right strains, as the beef and milk strains have been much inter-bred, in order to harden the one or to give size to the other; and, further, there is a so-called Dorsetshire type which, though often good, is of doubtful pedigree, and may have lost a great deal of the invaluable hardiness of its smaller kinsman in the acquisition of greater size.

The colour and markings are identical with those of the beef strains of the breed, but the size is somewhat larger, inclining rather to a milk type as compared with the remarkably compact Dartmoor-bred North Devon.

**THE NORFOLK RED POLLED.**—The Red Polled Norfolk is a breed of very ancient origin, and is undoubtedly a good dual purpose animal. The desire in recent years on the part of some breeders for more marked beef qualities has led to the formation of two strains, and here again one must be careful in buying to enquire into the ancestry of one's purchases and the general character of the herd from which they come. The breed may generally be described as having much the same characteristics as the Shorthorn, and more often of the dairy Shorthorn than the beef type. The entire absence of horns may be regarded as an advantage, and it is probable that the Red Polled cattle would be successful on land that is hardly good enough to carry a Shorthorn. The few specimens of the breed imported into Rhodesia within the last year appear to be quite satisfactory.

The colour should be a deep red, with an udder of similar colour. The brush at the end of the tail may be white. The head and throat should be clean, and the eyes full. The frontal bones should begin to contract a little above the eyes, and should terminate in a comparatively narrow prominence at the summit of the head. A tuft of hair should hang over the forehead. Any trace of horns indicates impurity of blood. The general shape and appearance should combine beef and milk qualities about evenly, but the bulk of the specimens of the breed in this country are more of the milking type than otherwise.



## Gwelo Creamery.

### HINTS AND SUGGESTIONS TO FARMERS.

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By W. G. ELLIOTT, Manager.

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It is of the utmost importance that great care should be taken in the handling of milk and cream during milking, separating, and during despatch to the creamery, for it is chiefly by the exercise of such care that the excellence of the product can be guaranteed. In the first place, all the utensils used should be of such a nature that they can be kept perfectly clean and sweet by washing in warm water, afterwards scalded with boiling water, and then allowed to remain for a time exposed to the sun and air.

Immediately each cow is milked the milk should be passed through a fine sieve into the vessel which will convey the milk to the dairy for separation: this will minimise the risk of dust and dirt getting into the milk and so tainting it. The milk should be separated at a temperature as near as possible to that at which it leaves the cow, but should it become cold through any reason, it is advisable to warm it up to a temperature between 85 and 90 degrees F.

The cream screw of the separator should be set to give a cream containing 40 to 45 per cent. butter fat. The number of hours cream can travel depends on many things, such as the condition of the cream at the commencement of the journey, age, if thick or thin, if pure and untainted, if cooled before despatch, if protected from sun and heat, and if conveyed by road or rail, by ox-wagon or spring cart. Cream of not less than 40 to 45 per cent. butter fat of good quality, if sent twice weekly, will travel any distance by train within the limits of the B. & M. & R. Railways in Southern Rhodesia. Cream

below 40 per cent. contains too much milk, which causes it to ripen too rapidly, and so become unfit for first-grade butter. It is also likely to churn in transit. Some of the most frequent causes of variation in the percentage of butter fat in cream are:—

- (1) allowing milk to become too cold;
- (2) not attaining proper speed of separator;
- (3) separator being out of order, owing to the bearings being worn; bowl set too high or too low, not rigid on stand, out of level; bearings clogged with oil and dirt, etc.;
- (4) variation in composition of milk, due principally to the time cows have been in milk;
- (5) irregular flow of milk, or allowing milk to enter bowl before speed is attained.

It is not advisable to add warm cream to cold: cream recently separated should be kept in a separate vessel until it is cool, when it can be added to the mass and well stirred.

It is perhaps unnecessary to mention that the dairy where the cream is kept should be cool and scrupulously clean, and limewashed occasionally. The lid of the cream can should not be kept on excepting during transit. A cloth or piece of muslin should be used to keep out the flies and dust. When the cream is despatched to the railway or to the creamery, the can should be protected with a clean, wet sack. It is necessary to have at least three sets of cans: one going to the creamery, one returning empty, and one to be at the farm. All cans must bear a brass plate bearing the supplier's name and the name of station or siding. Cans and separators are supplied by the creamery on easy terms of payment, deducted from the supplier's monthly cheque for cream. Payment is made at per pound for the actual butter fat content of the cream, as shewn by the Babcock test. Butter fat is the actual fat contained in commercial butter minus water, curd, salt, etc. Butter made on farms where there is difficulty in controlling the temperature often contains over 20 per cent. moisture, etc. South African creamery butter varies from 10 to 15 per cent. moisture. In most countries the legal limit is 16 per cent.



I do not advocate the use of preservatives in cream, except in extreme cases, as it means, as a rule, that where they are used the usual care and cleanliness will not be observed. Exception might, perhaps, be made in cases where suppliers are a long distance from the railway or the creamery, but preservatives must be used with the greatest care, as too much will certainly spoil the product.

Cream is graded into two grades at the creamery, suitable for making butter of first or second quality, and is paid for accordingly. In cases where cream arrives in an unsatisfactory condition, a report is sent to the supplier advising him of the condition of his cream and offering suggestions for improvement.

It is advisable, when consigning cream in a can which is not full, to attach a label stating the number of gallons it contains, otherwise the railway charge will be on the capacity of the can.

Cheques are sent out about the 15th of each month in payment for cream received the previous month. The price of butter fat varies according to the season of the year, and is governed to a great extent by the price of butter in the Union and in Australia.

The following is an extract from the bye-laws and regulations of the B. & M. & R. Railways, regarding the transport of milk and cream:—

Milk and cream in suitable cans are carried as station-to-station traffic, and at owner's risk. Charges must be prepaid unless arranged to the contrary with the traffic manager.

|               |     |     |     |     |     |                              |
|---------------|-----|-----|-----|-----|-----|------------------------------|
| 1 to 25 miles | ... | ... | ... | ... | ... | $\frac{1}{2}$ d. per gallon. |
| 26 to 50      | „   | ... | ... | ... | ... | 1d. „                        |
| 51 to 75      | „   | ... | ... | ... | ... | $1\frac{1}{4}$ d. „          |
| 76 to 100     | „   | ... | ... | ... | ... | $1\frac{1}{2}$ d. „          |
| 101 to 200    | „   | ... | ... | ... | ... | 2d. „                        |
| 201 to 250    | „   | ... | ... | ... | ... | $2\frac{1}{2}$ d. „          |
| 251 to 300    | „   | ... | ... | ... | ... | 3d. „                        |
| 301 to 400    | „   | ... | ... | ... | ... | $3\frac{1}{2}$ d. „          |
| 401 to 450    | „   | ... | ... | ... | ... | 4d. „                        |
| 451 to 500    | „   | ... | ... | ... | ... | $4\frac{1}{2}$ d. „          |
| 501 to 550    | „   | ... | ... | ... | ... | 5d. „                        |
| 551 to 600    | „   | ... | ... | ... | ... | $5\frac{1}{2}$ d. „          |

The minimum charge is 3d. per consignment. The weight of the milk can is not included in the weight on which charges are levied.

To obtain the benefit of the afore-mentioned rates, the consignor is required to specifically consign the traffic at owner's risk, failing which full parcel rates on actual weight will be charged at railway risk.

Empty milk or cream cans will be returned to the original sending station at owner's risk free of charge, and without a consignment note, on condition that a suitable brass or metal label, with the name of the owner and sending station engraved thereon, is soldered to the can, or such name and sending station are indented on the can, in a position suitable for easy inspection.

The following prices are charged by the Gwelo Creamery for cream separators:—

| Separator. | Size.                  | Retail Price. |    |    |
|------------|------------------------|---------------|----|----|
|            |                        | £             | s. | d. |
| Alfa Laval | Viola 1—14 gallons ... | 8             | 5  | 0  |
| do.        | Viola 2—22 gallons ... | 11            | 0  | 0  |
| do.        | Colibri 1—33 gallons   | 13            | 5  | 0  |
| do.        | Colibri 2—45 gallons   | 15            | 15 | 0  |
| Melotte    | No. 00—16 gallons ...  | 9             | 10 | 0  |
| do.        | No. A—28 gallons ...   | 13            | 10 | 0  |
| do.        | No. B—40 gallons ...   | 15            | 0  | 0  |
| do.        | No. C—50 gallons ...   | 17            | 10 | 0  |
| do.        | No. 1—40 gallons ...   | 19            | 10 | 0  |
| do.        | No. 2—50 gallons ...   | 21            | 10 | 0  |
| do.        | No. 3—60 gallons ...   | 28            | 10 | 0  |
| Ceres      | No. 00—16 gallons ...  | 7             | 10 | 0  |
| do.        | No. 0—22 gallons ...   | 9             | 10 | 0  |
| do.        | No. 1—33 gallons ...   | 12            | 0  | 0  |
| do.        | No. 2—45 gallons ...   | 14            | 10 | 0  |
| do.        | No. 3—55 gallons ...   | 17            | 10 | 0  |
| Perfect    | No. 10—22 gallons ...  | 10            | 0  | 0  |
| do.        | No. 11—30 gallons ...  | 11            | 11 | 0  |
| do.        | No. 12—44 gallons ...  | 14            | 14 | 0  |
| do.        | No. 14—66 gallons ...  | 17            | 17 | 0  |



Rustproof cream cans for distribution:—

3 gallons (labelled) ... 17/6 each.

5 gallons (labelled) ... 25/- each.

The following is the form of application in use:—

Place.....

Date.....

THE MANAGER,  
GWELO CREAMERY,  
GWELO.

As I intend to become a patron of your Creamery, I wish to obtain the following Dairy Appliances:—

One ..... Cream Separator, ..... gallons  
per hour ... ..

..... Cream Shipping Cans, properly  
labelled as follows:—

..... Three gallons at 17/6 each

..... Five gallons at 25/- each

---

Total ...

Please send the above-named Separator and Cans to me at your early convenience at .....

In consideration therefor, I agree that half any amounts that may become due to me by the Creamery for Cream supplied, shall be held by the Creamery until the above-mentioned sum is paid in full, and I undertake to sell to the Creamery all the Cream which I am able to offer for sale, and not to sell Cream to any third party during the continuance of this agreement.

In the event of my discontinuing to supply Cream to the Creamery, I undertake to pay within 30 days from the date I last supplied Cream, the full balance of the purchase price of the Separator or/and Cans.

I further agree that the ownership of the said appliances shall not pass to me until the full purchase price is paid, but shall remain vested in the British South Africa Company until payment is completed.

Signed .....

Farm .....

Station .....

P.O. ....

# Immunisation of Imported Cattle against Northern Rhodesia Piroplasmosis and Anaplasmosis.

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By F. CHAMBERS, Government Veterinary Surgeon,  
Northern Rhodesia.

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The problem of the immunisation of cattle imported from oversea against Anaplasmosis has for some time been the subject of discussion amongst veterinary pathologists in South Africa. Immunisation against Redwater (*Piroplasma bigeminum*) has ceased to be a dangerous operation since the advent of Trypan blue, but one cannot give Piroplasmosis without the attendant Anaplasmosis (*A. marginale*) making its appearance in the blood some twenty to thirty days after the Redwater reaction.

Two years ago Theiler, in the Union, discovered a new strain of Anaplasmosis, which he named *Anaplasma marginale* (*var. centrale*). This distinction was based (a) on the different positions the two parasites take up in the red corpuscles, (b) on the difference in sizes, there being slightly smaller individuals in the *centrale* variety, (c) on the different virulency, the *centrale* variety having caused neither death nor any serious lesions, and (d) on the fact that recovery from an infection from *Anaplasma marginale* does not cause complete immunity. Theiler states that an inoculation with *Anaplasmosis marginale* (*var. centrale*) can be made use of as a practical method of inoculation against Anaplasmosis. Recovery from *Anaplasmosis centrale* infection gives so much protection that a subsequent inoculation of *Anaplasmosis marginale* no longer causes death or any serious lesions.



In May, 1912, Bevan, in Southern Rhodesia, inoculated 39 imported cattle, with the result that 23 lived. The conclusions which Bevan arrived at from these results are: (a) That the maximum age which cattle can be inoculated with safety is 18 months; (b) that the possession of adipose tissue is a serious disadvantage; (c) that pregnancy constitutes a great danger, especially in its early stages, and that the injection of trypan blue, although cutting short the Redwater reaction, has such a profound effect on the tissues as to lessen the animal's power of resistance to the succeeding Anaplasmosis. These results were, in a sense, disappointing after the good ones which were obtained previously.

Early in April this year (1913) we were informed that two Ayrshire bulls would arrive at the Victoria Falls, *en route* for Kalomo, in the Territory. Under the existing regulations they had to be taken over the Zambesi by pontoon to the quarantine island. We were informed of the date of their arrival. Mr. Robertson, the Acting Director of Veterinary Research at Pretoria, posted me two doses of "Pretoria virus" (*centrale* variety). Unfortunately this virus never reached us, it being lost in the post. I saw the animals immediately after arrival, and found them in the usual condition after a long journey—unthrifty, pendulous abdomen, and soft. They were put on Long Island on the 17th March, and were fed with cut grass and forage (oathay). Regular exercise was given them in a cleared enclosure. We could not expect to keep them tick free, but did our best. A careful search was made each day, but no ticks were found on the bulls until 8th April. On the 2nd April, the eighteenth day of residence on the island, the two bulls received 25 c.c. citrated blood subcutaneously. The blood was taken from an ox which had been recently brought down from Barotseland. During the whole time these animals were under observation, only eight ticks were found on them. These were all of the *R. decoloratus* species. The Redwater reaction was not what could be called severe, and the infection never went over 4 per cent. In the case of the Red bull, recovery from Piroplasmosis might probably have taken place without the aid of trypan blue. As shewn by the severity of the Anaplasmosis reaction in the bull that received trypan blue, it is much better to avoid the use of this drug if possible. I mentioned previously that Bevan has shewn that the injection of trypan

blue has a deleterious effect on the animal organism and reduces the resistance to Anaplasmosis. In the middle of the Anaplasmosis reaction both bulls ate very little, and on one occasion the Red bull touched nothing all day, in spite of the fact that various delicacies were offered him in the way of sugar cane, cabbage, mealie stalks, and mealie meal. However, the administration of two drachms of the scale preparation of citrate of iron and quinine had a wonderful effect in lowering the temperature and stimulating the appetite. From the time that the iron and quinine was administered, the animals never looked back, and were sent to the owner on the thirty-fourth day after inoculation. The result must be described as successful, for I had grave doubts as to the advisability of injecting Northern Rhodesia blood, but if the animals had been sent direct to the farm it was highly probable that both would have died, for our form of Anaplasmosis is very virulent, and cattle immune to Southern Rhodesia Piroplasmosis and Anaplasmosis react vigorously to the injection of Northern Rhodesia blood. The owner saw that it was much better for the bulls to suffer from Redwater and Gallsickness here, where proper professional attendance could be given to them, than have them sick miles from any help.



## Notes on Bee-Keeping.

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By FREDERICK SWORDER.

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During our two hottest months—October and November—bees are much inclined to swarm. This is partly due to excessive heat generated inside the hive, and mainly brought about by the usually good supply of nectar secreted in our bush blooms. The conditions being very favourable, the queen is then fed more abundantly by the workers, causing her to lay a larger number of eggs daily; consequently, the hive becomes over-crowded with developing young bees and honey. Then, if steps are not taken to relieve this congestion, half the bees will be lost, and also the crop of honey. It is here that the good points of the frame hive come to our aid, and prove especially useful, for we are able to place above the brood-chamber, in the lift supplied with the hive, a crate of sections, wherein all surplus honey is secured for our own use.

After this has been set on, it is clearly evident from outside observation that the tendency to swarm has to a large extent been checked, for queen cells, which were in process of formation, have been broken down by the workers, while the storing of honey in the section crate is commencing. When a crate of sections has been added, much of the honey which was previously stored in the brood-chamber will be removed from there and deposited where we wish it to be stored, viz., in the sections above, thus giving the queen plenty of scope below for her energies. In most instances swarming will be abandoned. Another point worth consideration, and which also greatly assists in preventing swarming, is the providing of ventilation. This may easily be carried out after the crate is on, by raising the front of the brood-chamber about half-an-inch from the floor board. To do this, two pieces of wood of the required

thickness should be inserted at the front corners, but before doing so, smoke should be blown in at the entrance. These pieces of wood may be allowed to remain in position, say, for a month, until the propensity for swarming is passed.

Outward signs of swarming are clearly visible, for the bees will be very busy. It will also be seen that numbers of them are beginning to cluster unnecessarily at the entrance; besides this indication, large numbers of drones will be seen flying in and out. During the preparation for swarming, bees are practically playing a waiting game; it is then that, to be successful, we must not procrastinate, but at once take steps to put on the crate. It is far better to do this a few days too soon than a week too late.

Much valuable literature dealing with many points on bee-keeping is procurable, yet only very little really makes it sufficiently clear in detail as to how a crate of sections should be put on to a frame hive. It must be distinctly understood that the brood-chamber does contain its full complement of frames, and that the hive is crowded with bees. It is under this latter condition that the novice is somewhat inclined to shirk the responsibility, and cannot perhaps summon sufficient courage to undertake what seems to him too difficult an undertaking; yet, if the details mentioned below are adhered to, it is comparatively easy, and none need fear a failure. If carried out with success, it means so much more confidence gained by the novice, whereas if he fails in his first attempt, he retires hurriedly, with possibly a few stings, and disappointed, and bee-keeping on his part suffers a severe check.

When, in removing quilts from the brood-chamber, small wax attachments are seen projecting at the under sides of each top bar of the frames, it is a good indication that the space in the hive is too limited. Previous to putting on a crate, see that the sections have been properly folded and correctly fitted with full sheets of super-foundation, all hanging true and vertically. If separators or dividers are omitted, misshapen sections of honey will assuredly be the result. Although honey is coming in freely and perfect sections are expected at harvest time, care must always be exercised, for too often where this point, through carelessness or indifference, is neglected, the result must be disappointing.



Whether we work for prizes on the show bench or for sale, we must always try to obtain the best that nature can produce. An indifferent article is generally difficult to get rid of, whereas first quality honey in any recognised form will sell readily at an enhanced figure.

In the early morning or late in the afternoon, with the smoker well alight and the carbolic cloth in readiness, go to the hive and give three or four puffs of smoke at the entrance, just sufficient to drive in the guards stationed there. Then remove the roof and the hive lift; take off the quilts and packing, but allow one quilt to remain on the frame tops, so that for the time being the bees are kept in their proper place. With the thumbs and fingers now take hold of two corners of the carbolic cloth, one in each hand, allowing the other two corners to hang down outside the hive in front of the entrance, opposite to where you stand. Grasp each corner of the remaining quilt farthest from you, still holding the carbolic cloth, and with both hands pull this quilt and the carbolic cloth steadily towards you. It will be noticed that the quilt which covered the frames has been removed, while the carbolic cloth has taken its place, with scarcely a bee escaping; this is as it should be.

The odour given off by the carbolic cloth is now doing its work, viz., driving down the bees, thus preparing the way for putting on the crate without crushing any inmates. The carbolic cloth may remain in position for quite ten seconds. This period having elapsed, an examination of the frame tops can now be made, and if it is seen that propolis has been deposited on them by the bees, the top bars must be cleaned by a scraper to enable the crate to rest close on to them. During this operation bees must be kept down, either with the smoker or the carbolic cloth, while, as the cleaning progresses, those frames which have already been scraped must be covered up with a quilt. Just for a few seconds put on the carbolic cloth, pick up the crate with one hand, remove quickly the carbolic cloth, and at once set the crate on the frames with the other hand, adjusting it squarely so that no bees can escape up outside it. Their proper place is inside the hive, and they must be kept there. By this addition it can be seen that the

hive has simply been enlarged, the operation having occupied less than five minutes. When successfully carried out, not a bee is crushed.

The above plan being expeditious and simple, I invariably advocate and adopt it in preference to the smoker. Now put on the hive lift, and pack around and on top of the crate warm clothing to the thickness of three inches at least. This clothing is of great importance, for the crate must be kept at an even temperature, otherwise the bees will not enter.

When the carbolic cloth is used it will be noticed that many bees are driven out at the entrance, but as its odour becomes evaporated in the hive they will soon re-enter their enlarged home and resume operations with renewed vigour. Do not be over-anxious as to what is taking place by too frequent visits to the hive interior, but rest content for a week, remembering that while you have done that which was necessary, the bees in return will assuredly be doing their share. When it is seen that the bees continue to bring in nectar, a slight examination of the section crate only may be made.

With the lighted smoker stand at the back of the hive, quietly remove the roof, lift up the clothing or quilts at the most convenient corner, and blow on to the exposed sections just sufficient smoke to keep the bees down. Do not give large volumes of it, as this will cause a cessation of work for a whole day. Being satisfied that there are plenty of bees in the crate, and that the sheets of foundation are being drawn out, cover down again, quietly replacing everything as it was. In this case no smoke is needed at the entrance. For this slight examination, if preferred, the carbolic cloth may be used in place of the smoker with equal effect.

Some bee-keepers place a sheet of queen-excluder zinc between the brood-chamber and the crate. Its purpose is to prevent the queen from gaining access to the upper storey, where occasionally, if she be a young one, she will lay eggs. The drones also cannot pass up through it. These are some of its advantages, yet, owing to the openings being limited in size, bees cannot so readily pass up through it. Personally, I seldom use it, but where shallow frames are placed above the brood-chamber in which honey is stored for extracting purposes its use is essential.

*(To be continued.)*



## The International Beef Trade.

At one time the United States were easily the largest exporters of beef in the world, but in recent years the position has entirely changed, and Argentina now takes pride of place with an export trade nearly five times that of her neighbour. The change in relative positions of the two countries as beef exporting nations has occurred since 1905, and so marked has the development been that the attention of the entire world has been drawn to Argentina as a rapidly growing and exceedingly important factor in the world's supply of beef. As the beef export trade of Argentina has increased, so that of the United States has declined, and this state of affairs, coupled with the fact that there is now a serious shortage of beef in the United States, has induced the University of Illinois Agricultural Experiment Station to conduct a series of investigations which include an analysis of the relationship of the United States to the world's beef supply, and also of the position of Argentina as a factor in the international beef trade.

The results of these investigations are given in Circulars Nos. 163 and 164, and make interesting reading. Before we go any further, it may be useful to extract some figures shewing the exports of beef of the principal beef producing countries of the world.

### EXPORTS OF BEEF.

| Country       | 1900        |            | 1905        |            | 1910        |            |
|---------------|-------------|------------|-------------|------------|-------------|------------|
|               | Pounds      | Value      | Pounds      | Value      | Pounds      | Value      |
|               |             | \$         |             | \$         |             | \$         |
| Argentina     | 93,492,000  | 4,418,000  | 398,223,000 | 18,598,000 | 580,142,000 | 25,480,000 |
| United States | 434,258,000 | 37,772,000 | 359,247,000 | 31,836,000 | 127,406,000 | 12,196,000 |
| Uruguay       | 127,310,000 | 6,290,000  | 103,050,000 | 4,250,000  | 125,450,000 | 4,934,000  |
| Australia     | 96,216,000  | 5,529,000  | 43,525,000  | 1,150,000  | 71,140,000  | 3,568,000  |
| New Zealand   | 35,895,000  | 1,812,000  | 17,118,000  | 930,000    | 56,012,000  | 2,847,000  |
| Canada        | 5,727,000   | 529,000    | 39,688,000  | 3,631,000  | 1,312,000   | 115,000    |

To-day the Argentine Republic must be looked upon as the most important factor in the world's market as regards the amount of surplus beef sold, while it is said that the quality of her beef product is fast improving. With only twenty-nine million cattle, as compared with seventy-one million in the United States (1910), Argentina is in a position to maintain her export trade in beef by reason of the small population (seven million) and consequently limited domestic consumption of beef in that country. Whether or not expansion of beef production in Argentina takes place in the future will depend largely upon market conditions. On the other hand, in the United States, a rapidly growing population of ninety-two million renders it doubtful whether the production of beef in that country will equal the demand, unless a rapid expansion of the cattle raising industry occurs in the near future, and this is considered improbable. Cattle raising for beef in Argentina, especially in the temperate zone it is found, is a much more favoured industry than in the United States. The climate makes it possible for the entire life of cattle to be spent out of doors without shelter, and generally without shade of any kind.

Lucerne grows most luxuriantly, and the suitability of a very large acreage for the growth of that crop and of other nutritious, indigenous and introduced legumes and grasses, together with cheap land and labour, makes it possible to produce beef cheaply. Thus, "To anyone unacquainted with the possibilities of the country, the degree of fatness which the cattle acquire on grass or alfalfa alone is a marvel." Maize feeding as a supplement to pasture for beef production is extremely rare, but it is remarked that there is quite an extensive area well suited to the growing of this crop. If the time ever comes when slaughterers pay a sufficiently high premium for corn-fed beef, it is believed the country can produce ample for this purpose.

One of the most striking features of the recent development of beef production in Argentina is the great improvement in quality or breeding of the cattle. Many Argentina estancieros have spared no trouble nor expense in effecting improvement of the common stock of the country. This, it is stated, has been accomplished chiefly by importations of high-class pedigreed beef and dairy cattle from Great Britain. It is a



historical fact that the cattle breeders of Argentina, and more especially the breeders of registered beef cattle, have bought the best that Great Britain has produced, without much reference to their cost.

In the herd-book of the Argentine Rural Society in 1909, there had been registered about 50,000 pedigreed cattle of beef breeds, some 4,000 of which were imported, and not all pedigreed cattle are registered in the Rural Society's book. During the period from 1880 to 1907, 16,156 pedigreed cattle were imported into Argentina, 14,624 of which were brought from the United Kingdom; and in the two years, 1907 to 1909, over 9,000 head were imported from England alone. About 70 per cent. of the beef exported from the United States goes to Great Britain. The latter is by far the leading buyer of dressed beef, and the Bulletins shew how rapidly Argentina has practically monopolised the British beef market by the fact that of the total dressed beef imported into Great Britain in 1911, 84 per cent. was shipped by Argentina and but 2 per cent. by the United States. It may be interesting to quote the average prices of dead meat at London in April, 1913, given in the Journal of the Board of Agriculture. English beef fetched top price, 63s. 6d. per cwt. being paid for first quality. Irish port killed beef is quoted at 61s. 6d., Argentine chilled hind quarters at 49s. 6d., and Australian frozen hind quarters at 36s. No prices are given for United States beef, and apparently there was none offering.

Concern was expressed that the business of raising beef cattle in the United States might be permanently menaced by Argentine competition, but fears in this direction appear to have been allayed by reason of the fact that expansion of the cattle-raising industry in Argentina has ceased, largely because grain growing is proving more profitable than cattle raising.

# Poultry Keeping in Southern Rhodesia.

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By C. C. GIRDLESTONE.

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Poultry keeping is an insignificant feature of farming in this country at the present time, but, following in the wake of other British colonies, it must eventually make good its claims here as a profit-earning industry. There are disadvantages peculiar to Rhodesia with which the prospective poultry fancier will have to contend, and it is in the initial stages of the industry that these will be most felt. They are briefly:—

- (1) high cost of importing thoroughbred stock, and losses during its acclimatisation;
- (2) high price of foodstuffs;
- (3) high cost of materials for buildings, runs, etc.

These are doubtless strong factors in deterring many from turning their attention to the commercial prospects of the feathered industry, but to counterbalance them there are undoubtedly many advantages here shared by no other state or colony. For instance, climatic conditions generally are favourable, disease and insect pests are normal, while market prices for the product, both birds and eggs, are far in excess of those ruling in any other producing country.

The average market price of new-laid eggs—local product—during the last twelve months was somewhat in excess of 3s. per dozen, fluctuating between 2s. 6d. and 5s., according to season. Of table birds, the quantity marketed has been so insignificant that a market value can only be estimated. Taking as a basis the wholesale cost of imported live birds, the market value of a well-fattened bird bred for table would be not less than 5s., or 1s. per lb. if sold by weight.

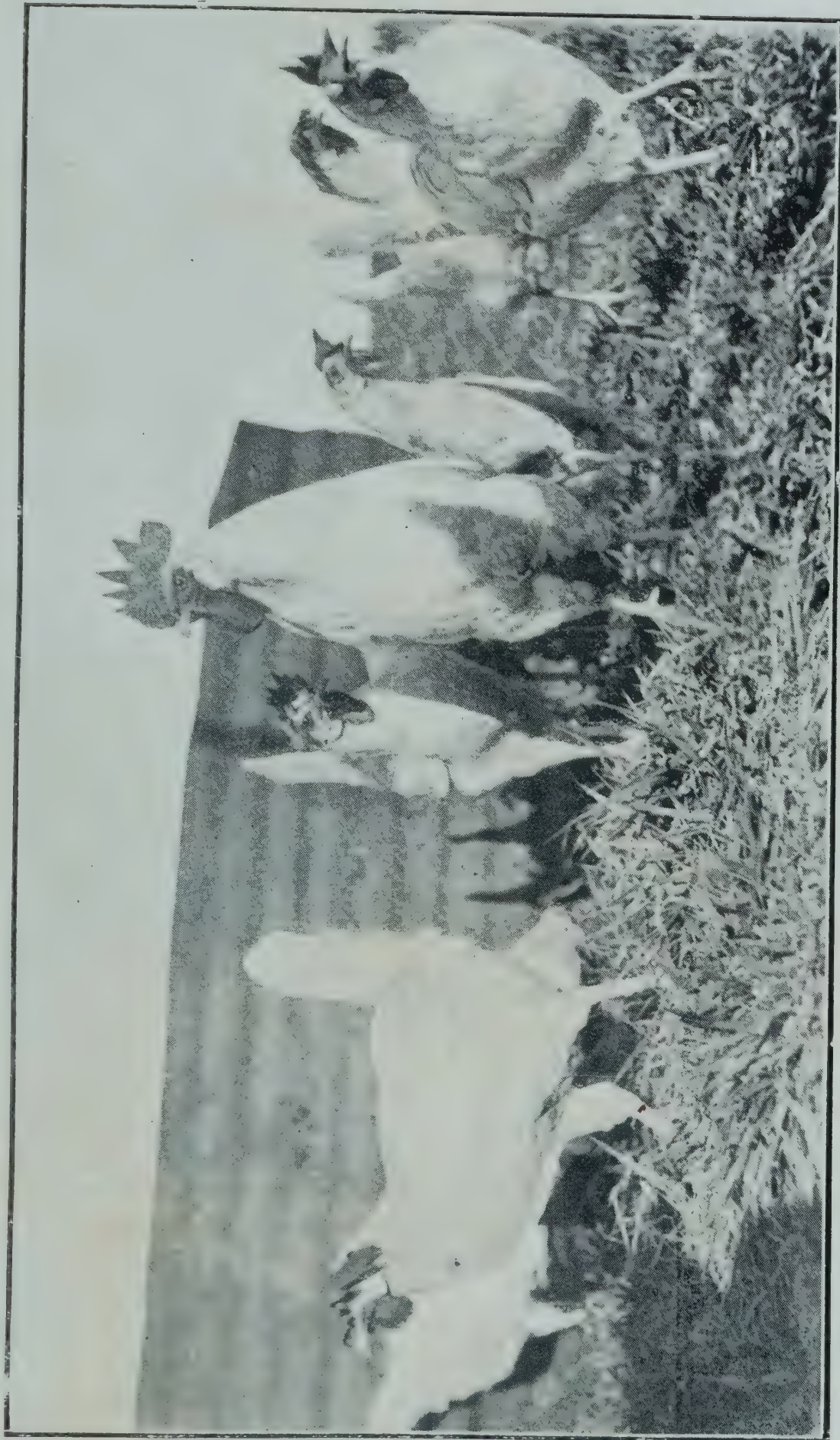


It will be many years before Rhodesia can produce all her requirements in this direction, and a greatly increased output can be assimilated before prices are materially affected. The imported article cannot hope to compete with local product, as heavy railage must be added to cost, breakages and deaths must be charged to the consumer, and consequently an enhanced output will tend to a reduction in importations rather than in prices.

In countries where poultry keeping has been in course of development for many years, keenness of competition compels an unceasing attention to every detail of management. A maximum of thrift and efficiency cannot produce more than a bare margin of profit, out of all proportion to the capital and labour involved. No comparison can be drawn between such conditions and the prospects of poultry farming as an industrial venture in Rhodesia.

“Start in a very small way.”—This is a well-worn maxim, to be seen in almost every text book dealing with the subject, but its repetition may not be out of place here. The beginner has no reference book based upon local experience to guide him, and must consequently advance warily, gaining his experience as cheaply as he can. The first problem to be solved is the selection of a breed calculated to yield the highest return of marketable eggs, as this is likely to be the most profitable branch of the industry for a long time to come. We have no local laying competition records or statistics of any kind to help us in selection; it will, therefore, be advisable to restrict choice of breeds to a variety or varieties of proved value under climatic conditions as closely resembling our own as possible.

The authentic records of the Union are our best guide in this respect, and in a lesser degree those of Australia. In both countries one breed carries off all honours in official egg-laying competitions with ease, namely, the White Leghorn. Until it can be ascertained if any other breed can develop higher laying qualities under conditions peculiar to Rhodesia, the safest policy is to assume that the world-wide reputation of the White Leghorn as the most prolific layer has been achieved mainly by its adaptability to varying climes and conditions, and to select that breed in forming the nucleus of a flock. The breed established a world's record in the egg-laying



Exhibition White Leghorns imported by the writer.





competition held under Government supervision at Roseworthy Poultry Station, near Adelaide, South Australia, 1911-12, a pen comprising six White Leghorn pullets laying 1,589 eggs during a period of twelve months, or an average of 264.8 eggs per pullet.

No good purpose can be served here in describing numerous other breeds, many of which have some good qualities to recommend them—it is with poultry from a commercial aspect that we are concerned. There is, however, one most important point to be considered. Leghorns are a non-sitting breed, and the majority of small beginners will be well advised to defer artificial incubation until some experience of general management has been gained. Another breed of bird must be run in conjunction with the non-sitter, and selected primarily for motherly qualities. For this purpose the Wyandotte has a good reputation, well earned, being not only a good sitter, but as a layer and table bird well able to justify her existence in any poultry run. Where a good type of cross-bred Colonial bird is already kept, fair layers and good sitters, these can be retained for hatching purposes, and a fair subsidiary stock of utility birds may be developed from them by obtaining a few thorough-bred cocks of a sitting variety, and so grading up to a higher standard. It is, nevertheless, questionable economy in the long run to breed, or breed from, impure stock. Cross-breds, no matter what their laying capabilities may be, have no individual value beyond their worth for the table. On the other hand, thorough-bred young stock is likely to find a ready market at a price double or treble that of its killing value. There is a fair local demand for pullets and cockerels of popular breeds for stud purposes, and it is probable that this demand will considerably increase if intending purchasers can be assured of obtaining what they require at a reasonable figure.

The selection of breeding stock is beset with many difficulties and pitfalls. It is only of late years that breeders in the South have paid much attention to the scientific side of breeding for egg-production and utility standard, and although there are numerous advertisers of breeding birds and pens, much discrimination must be exercised by the Rhodesian buyer, or he will find himself saddled with worthless stock. There are a number of trustworthy breeders of first-class laying



strains in South Africa, and it may be found more advantageous to deal with them than to import from overseas. The birds arrive in better health and condition, acclimatise more readily, and a very material saving in cost is effected. Assuming choice of a thoroughly reliable breeder, the following points should be emphasised when ordering a pen of birds—

- (1) cock and hens to be of a stated laying strain;
- (2) of a stated age, as uniform as possible;
- (3) hens to have been tested for egg-production for a period of not less than six months, or progeny of a pen so tested, and to be accompanied by a certificate of result of test.

The foregoing are most essential conditions of purchase, with which any professional breeder should be in a position to comply. Other considerations of less importance are:—Age, which must be mature but not advanced; suitability of mating; freedom from disease, and from bad habits, such as feather and egg eating.

In the next issue of the *Journal* some suggestions will be offered in connection with housing and general management.

## Slaughter Competition at Salisbury.

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### THE BLOCK TEST.

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Twenty-three animals were entered in competition for the prize, value £10, presented by Mr. F. J. Newton, C.M.G., C.V.O., for the best slaughter animal at the Salisbury Agricultural Show, held on the 24th and 25th July. It had been stipulated by the donor of the prize that special consideration was to be given to quality, weight for age, distribution of the meat, and so on. In order to meet these requirements the system of judging known in England as the "Block Test" was adopted. By this system the animals are first judged alive and again after slaughter on points, and the prize is awarded to the beast gaining the largest aggregate of points in the two sections. On the occasion under consideration, owing to a misunderstanding, the beasts were not judged on points alive, but by the ordinary method.

Amongst the competing animals were a number of heavy trek oxen of Friesland and other crosses, varying in age from 6 to 12 years, several Mashona and Angoni types, and one half-bred Shorthorn-Angoni heifer. Those selected alive as the best animals were as follows:—

- 1st.—A half-bred Shorthorn-Angoni barren heifer (the property of the Rhodesia Ranching Co.), 3½ years.
- 2nd.—An Angoni ox, aged.
- 3rd.—A Mashona ox, aged.

All were good of their type. They were fat, and in good condition. These animals were then slaughtered and the carcasses judged on the following morning on points. The details of the carcasses and the points given were as follows:—



| Type of beast              | Live weight | Dead weight | Approximate per-centage of carcase to live weight | Proportion of hind quarters and more valuable meat to fore quarters and less valuable meat |
|----------------------------|-------------|-------------|---|--|
| Half-bred Shorthorn heifer | lbs. 960    | lbs. 552    | 55 %  | 15 lbs. hind quarters in excess of fore quarters   |
| Angoni ox - -              | 970         | 567         | 56 %  | 5 lbs. fore quarters in excess of hind quarters  |
| Mashona ox - -             | 1095        | 604         | 60 %  | 8 lbs. hind quarters in excess of fore quarters  |

In the Angoni ox the hump, which weighed 27 lbs., was included in the fore quarters.

The marks given were as follows:—

|  | Half-bred Shorthorn heifer | Angoni ox | Mashona ox | Possible points |
|--|----------------------------|-----------|------------|-----------------|
| Proportion of carcase to live weight         | 45                         | 45        | 50         | 50              |
| Proportion of hind quarters to fore quarters | 25                         | 0         | 15         | 25              |
| Quality of meat - -                          | 10                         | 8         | 6          | 10              |
| Weight for age - -                           | 15                         | 10        | 0          | 15              |
| Total -                                      | 95                         | 63        | 95         | 100             |

This reversed the order of the second and third animals in the previous competition.

Messrs. Tom Meikle and Hepker, of Bulawayo, who judged the above animals, expressed approval of the system of judging, and gave it as their opinion that the marks awarded correctly represented the relative values of the animals. The educational value of this system will be readily seen. It will be observed, for instance, that although the Mashona bullock gave 60 per cent. of carcase to live weight, much of this carcase was coarser meat as compared to the carcase of the half-bred Shorthorn, which gave 55 per cent. of carcase. The quality of

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the meat and the weight for age are also adequately allowed for. The question of weight for age needs no comment, as it must be apparent to all that a beast that will produce a given weight of carcase at 4 years must be more profitable than one which takes 6 or 8 or more years to produce the same weight. Again, we are assured by practical butchers that the distribution of the meat, *i.e.*, the proportion of more valuable to less valuable cuts, is a very important factor in arriving at the value of any animal. This one competition, of course, proves nothing beyond the value of the system, but it is sincerely to be hoped that it may be regularly adopted at Rhodesian shows, and continued annually, as by no other means can such valuable and reliable information on the subject of the value of the different beef-breeds be obtained.



# Union Agricultural Shows.

## RHODESIAN EXHIBITS.

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By O. F. LETHBRIDGE MONEY.

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Having visited many of the Southern Colonial Agricultural Shows during the past six months, readers of this *Journal* may like to have a short account of the impressions gained therefrom. The following agricultural shows were visited with exhibits from Southern Rhodesia, namely, Rosebank, Middleburg, Aliwal North, Johannesburg, Port Elizabeth, Kimberley, Bloemfontein, Pretoria, Pietermaritzburg, and Durban. There is no doubt left in my mind that agricultural shows can teach us a great deal. The maize exhibits in Natal were very good; not only white, but also several varieties of yellow mealies were exhibited. I found that the farmers are very careful about selecting their seed. They are very particular in making off their seed, and when I suggested that it was a very slow process making off by hand, they assured me that in order to have good seed that will germinate, this is the only way. I would like to emphasise this, because I know some farmers are under the impression that maize seed can be made off through the machine, or by sticks.

The Rhodesian exhibits of cereals, tobacco, fruit, and butter were all favourably spoken of, and I often heard remarks passed, "We cannot grow mealies, kafir corn, oranges, etc., like them." Our exhibit of butter would have held its own at any show in the Union; the fruit, both deciduous and citrus, was a great attraction, and the bright leaf tobacco was considered excellent. The demonstrations of mechanical traction interested me greatly. Marshall's 4-cylinder oil motor



Rhodesian exhibits at Union Agricultural Shows.





tractor, drawing a Howard's 8-furrow gang plough at Bloemfontein in hard unbroken soil left all steam tractors standing, and ploughed a furrow 12 inches wide by 9 inches deep. Wherever to-day mechanical power is being adopted, horse or ox traction is dropping out. The oil motor tractor is cheaper to run, makes it possible to plough immediately after reaping, reduces native labour, and in more ways than one is a saving to the farmer, as well as being a great assistance to him for other purposes on the farm. In Canada, America, Australia and Russia, to-day mechanical power is displacing the horse or ox. Passing through the Cape Province, Orange Free State, Transvaal and Natal, it is surprising to see how many farmers are adopting mechanical power. This particular tractor and plough is equal to ten teams of oxen, can be driven by either petrol, petroleum, alcohol, or naphtha, and although the outfit may cost about £1,200 to start with, after a few years it will be found that with the increased acreage it enables one to put under the plough, it has reduced so materially the cost of production, as against ox traction, that no one need be afraid of the initial outlay of so much capital.

At Pretoria a very interesting demonstration was given by Messrs. Nobel's company of sub-soiling with dynamite. Holes for sub-soiling were first made at a depth of 2 ft. to 2 ft. 6 in., and a charge placed in each hole. After ignition by hand, it did not do more than just raise the ground a little. Then a deeper hole was made and a stronger charge inserted for tree planting, with the effect that a good sized hole was made, the sub-soil broken, and all that remained to do was to clear out the hole to the required depth before planting the tree.

Finally, a demonstration was given of excavating a furrow. Two rows of dynamite were put into the ground 2 ft. 6 in. deep, 3 ft. apart, and 3 ft. wide, and all these charges were connected with a wire on to a small electric battery. Explosion took place at once, and nothing more remained to be done but to take the scoop and clear out the soil from the furrow. This demonstration plainly shewed that time and labour could be saved by the adoption of explosives, thereby reducing the cost of construction considerably.



I was particularly struck during my travels with the number of dams constructed and under construction, whereby a few acres of lucerne and other crops are placed under irrigation, and water conserved for stock; it is astonishing to find how greatly these dams increase the value of the land.

In conclusion, I would like to add that after touring the Union and looking back on the progress Southern Rhodesia has made in the last 12 years, it appeared to me that we have advanced quicker than we who live in this country fully realise. I know that your space is limited, and I have tried, therefore, to touch only on some of the main points of the tour that came to my notice.

# Champion Bull of Rhodesia.

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## A THOUSAND-GUINEA TROPHY.

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### THE SCHEME OUTLINED.

At a meeting of the Rhodesia Farmers and Landowners' Association, Mr. P. B. S. Wrey, President of the Bulawayo Agricultural Society, addressed a large gathering of members on the subject of the "Thousand Guinea Trophy," which that Society had decided to offer for the "Champion Bull of Rhodesia" at future shows.

Mr. Wrey said: I may mention, and I do so with immense pride and pleasure, that the whole of the money requisite for the trophy itself has already been raised, and is entirely the result of individual subscriptions, and I take this opportunity, on behalf of the Society, of thanking all those who have already given to the fund, and, in anticipation, thank those who, I feel sure, are still going to give, for it is not alone for the trophy that funds are required, but large expenditure will be necessary to erect ample and adequate accommodation in our show yard, and for the proper advertising and organising of the details in connection with the competition.

SOME DETAILS.—I would propose now, gentlemen, giving you, firstly, as full details as I can concerning the trophy, and concluding with a few remarks relative to the factors which have induced the Society to make this big effort to assist the cattle industry of Rhodesia.

In addition to the trophy, which is a floating one and open to the whole world, the Society propose to give £50 as a money prize and also a replica of the trophy.



The Society has further determined to give free entry to the competition for a period of ten years, commencing 1914, to all subscribers of £25 and over for the trophy and its allied fund, and I have pleasure in stating that there are to date 43 subscribers who will so benefit.

In order that the Society may have some idea in advance of the numbers likely to compete, it has decided to open forthwith an entrance register for bulls competing, the fee for such registration to be 2s. 6d., and those registering will have prior claim to accommodation in the show yard. The date of the final acceptance we cannot at the moment state, but will probably state within a month of the actual date of the show.

The three Agricultural Societies of Bloemfontein, Johannesburg, and Port Elizabeth have been asked to appoint two judges and one referee to judge the competition.

The Judges' Association of the Union of South Africa has been asked to furnish us with suggestions regarding the actual details of the judging. Circulars have been addressed to the leading owners and breeders in the British Isles, Holland, Australia, New Zealand, the Union of South Africa, and Rhodesia, calling their attention to this world-wide competition, and asking for their support.

It is encouraging to note that rumours of the competition have apparently reached Ireland, for we have already received kindly offers from the Agricultural Department of that country to act in any way they can as an intermediary between us and the cattle breeders there.

We hear also that very considerable interest relative to the competition is being shewn in the Union of South Africa.

I would like to take the opportunity of saying a few words regarding the reasons which have to a very large extent induced the Society to offer this very substantial prize.

In doing so, and in any words I may utter, I trust you will be assured that I am not consummate fool enough to insult a body of farmers by attempting to pretend I or the Society can teach them their own business, but many men, while generously subscribing to the fund and stating that they

thought the idea excellent, have expressed the opinion that possibly we were a bit previous, and it is mainly to this point that I would like to draw your attention and put forward a certain line of argument.

RHODESIA AS A CATTLE COUNTRY.—Firstly, we have both ocular and practical demonstration that Rhodesia, especially this western section, can grow and produce cattle, and does undoubtedly offer great possibilities for the further expansion of this important industry. Granted, we have had our setbacks with disease and recent droughts. With, however, increased knowledge, attention, and inspection, the former, as in every other country, is gradually lessening and disappearing, and the latter, from what we learn from the history of the country, are spasmodic, and possibly in its way the recent drought was, when the question is treated as a national one, a blessing in disguise, teaching many of us the vital importance of making ample provision for a sufficiency of feed for dry periods.

That we have enormous possibilities in the future of the industry is the view held by all who have studied the question; but, in order to strengthen and confirm these opinions, I would strongly recommend you to read a book, by name "Reed Antony; Cowman," for therein you will see how with climate, soils, and conditions very similar to our own, the great cattle industry of Texas started and developed, and how successful it proved.

A conversation also I had a short while since with a Rhodesian who had recently visited Texas more than ever confirmed my opinion regarding our possibilities, for after graphically describing to me the similarity of conditions existing there, so marked that at times, he informed me, it was difficult to realise that he was not in Rhodesia, he produced a photograph of a four-year-old Hereford steer weighing over 3,000 lbs. which he saw in that country, and informed me that the original stock from which the present class of high-grade cattle had been graded up closely resembled in size and shape the ordinary native Matabele cow of Rhodesia.

Well, gentlemen, it is needless to say, if they can thus grade up in Texas, we here with similar conditions can do like-



wise, and with a spirit of true Rhodesian optimism possibly, I would venture to say, go one better.

My next point, gentlemen, having assured ourselves that we can grow cattle, is to ask what we are going to do with the progeny of the herds which are increasing every day, and will continue in even greater numbers to be increased within the next few years, I feel sure.

We are not growing for the pleasure of looking at them. It is a serious and, we hope and intend, a money-making enterprise, undertaken by hard-headed, keen business men, and the future ahead is what it behoves us to study, for it is obvious we cannot go on in perpetuity selling beef to one another.

In studying this aspect of the question, let us take the two factors of demand and supply which, as in every other business, will govern this cattle industry.

DEMAND FOR BEEF.—The present demand for beef absorbs in Rhodesia per annum, say, 30,000 head. Now, supposing, and I hope it may prove true, that in seven years' time the population has doubled. Its butchering requirements we will then assume to be 60,000 head per annum. To this we will add what I may term increasing demand for and the wastage in transport animals, for the bulk of them ultimately go to the butcher, say, 30,000 per annum. Thus we have a total absorption in seven years' time estimated to be, say, 90,000 head of cattle per annum. Let us now see what will be the probable position of the herds and their male increase at the end of a similar period, viz., seven years from now. It is estimated that there were owned by the white men alone in Southern Rhodesia at the 31st December, 1912, 100,000 cows, which estimate is considered a conservative one. We may also take it, I think, that there will be bought per annum, either from the native or from the South during the coming seven years, say, an average of 15,000 head of cows per annum. It is merely now a matter of calculation for us to arrive at the approximate number of steers rising four years old which, under normal conditions, should exist in the country at the end of the year 1920, or seven years hence. Without troubling you with details, I will state that on a basis of 50 per cent. net

increase, of which one-half may be males and one-half females, and allowing the additions by purchase per annum to be 15,000 head of cows, the estimated number of bullocks rising four in 1920 is 94,000, a number practically equivalent to that I have stated will be absorbed by the country at that time.

**FUTURE OF CATTLE INDUSTRY.**—Now, gentlemen, we are discussing the future of this industry, and I put it to you, shall we wait until this balancing of Rhodesian supply and demand culminates seven years hence, or shall be, without further loss of time, boldly face the problem ahead of us and commence now driving our industrial wedge to what must be our future destiny, namely “export”?

If we choose the first, what awaits us? Two most unpleasant facts, the first of which is we shall awake to the fact that we have no purchasers locally for our surplus stock, at any rate at paying prices: and the second, if we then, and then only, turn to export we shall find that the majority of our stock—the common cross with the native—is wholly unsuitable either as regards size or quality for the export trade.

Well, the Society is strongly of opinion that the second course, the commencing at once to prepare for the export trade, is the right and by no means a too previous one, and as size, quality, and, what is of equal importance, early maturity, can only be provided by the introduction of good blood, they have endeavoured by rising to the occasion and offering this valuable trophy to assist towards this end. They are in hopes that by thus boldly advertising our possibilities and our requirements, we may draw good strains of blood from all parts of the world.

There is, unfortunately, no time at my disposal to give details in connection with two questions which may naturally be expected to arise, viz., does the world require our beef, and, if so, will it pay us to export?

I would briefly state that the world's demand for beef is yearly increasing out of all proportion to the increase of cattle, and that the present ruling price for frozen beef would yield for a carcase 720 lbs. in weight, which appears the favoured size, a net amount to the seller varying from £8 15s. to £9 5s.



In conclusion, I would just like to say that this trophy is offered by the Society in no international or individual town spirit; it is a bold advertisement meant to benefit the whole of Rhodesia alike, and I am only echoing what has been said by many a subscriber when I say I feel sure this trophy will form a historical milestone in the progress of the farming industry of Rhodesia.

As such, gentlemen, we shall feel it an honour to have the name of your Association, the oldest in the country, I believe, engraved thereon as a subscriber, and not only the name of your Association, but I think and I trust all the other Associations will follow the generous lead of the Figtree and Nyamandhlovu Associations, and assist us with a like subscription of £25 each.

A vote of thanks to Mr. Wrey was carried with acclamation.—*Rhodesia Herald* report.

# Twelve Simple Rules

RECOMMENDED TO BE PRACTISED FOR THE

## Avoidance of Malaria and Blackwater.

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By A. M. FLEMING, C.M.G., M.B., F.R.C.S. (Ed.), D.P.H.  
(Camb.), Medical Director, Southern Rhodesia.

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1. See that no collections of water are allowed to remain near the house, and that all hollows in the ground or in the stumps of trees or irregularities in roof-gutters are filled in or repaired, and that water is given no means of collecting after rain, for in such collections of water mosquitoes breed.

2. See that the house is well removed from streams, vleis or marshes, irrigation furrows, dams, duck ponds and artificial collections of water—the distance being, where possible, at least half a mile—for in these mosquitoes breed.

3. See that all rain-water tanks and receptacles where water is stored for household use are protected at all openings with mosquito-proof gauze, for in these mosquitoes breed.

4. See that all long grass, bush and scrub are kept cut and cleared round the house for at least 200 yards, for in these mosquitoes shelter.

5. See that all the rooms are painted in light colours or whitewashed, and thatched roofs ceiled with white calico, for mosquitoes prefer dark surfaces to rest on and light colours tend to repel them. Moreover, on light surfaces they can easily be seen.

6. See that all doors and windows are screened with mosquito-proof gauze. With a little ingenuity and the outlay



of a few shillings this can easily be fixed to the openings in wattle-and-daub houses or circular huts, as well as to brick or wood-and-iron buildings. By this means the mosquito is prevented from biting you.

7. Always have mosquito-screened doors fitted with springs, so that they close of themselves, and always see that these doors are kept shut, and that the mosquito gauze on them and on the windows is in repair.

8. Always sleep under a mosquito net, for the mosquito bites most at night, when it is dark and you are quietly in bed and asleep, and even with screened doors and windows one or two mosquitoes may get in and bite you.

9. See that the huts and sleeping quarters of the native farm servants are at least a quarter of a mile from your house, for natives almost always harbour the parasites which cause malaria, and from them the mosquito largely draws the parasite which it passes on to you.

10. Never forget that persons who are suffering from malaria, or who have recently recovered from an attack, are a source of danger to others, for they contain the parasite in their blood, which the mosquito draws from them when it bites them and sucks their blood, and which it passes on to you.

11. Always take 5 grains of quinine every evening, so that the parasite may be prevented from multiplying in your blood. Small doses of quinine such as this, taken regularly, will do you no harm.

12. Never forget that malaria and blackwater are the result of infection by a little parasite which is passed into your blood through the proboscis of the *Anopheles* mosquito when it bites you. Therefore, in order to avoid malaria and blackwater, you must firstly attack the mosquito by destroying or removing the places where it breeds and shelters; secondly, you must protect yourself from being bitten by living in a mosquito-proof house and using a mosquito net; and, thirdly, you must prevent the parasite multiplying in your blood by taking quinine.

# The Analysis of Agricultural Products, Soils, Water, etc.

## SCALE OF CHARGES.

Arrangements have been made for the chemical examination of soils, grain, and other produce, oil-seeds, milk, water, fertilisers, etc., on behalf of farmers and others by the Chemist attached to the Department of Agriculture. The charges made, while not covering the cost, will help to defray the expense and serve as a proof of good faith. Samples, carriage prepaid, together with full particulars regarding the subject, should be addressed to the Agricultural Chemist, Department of Agriculture, Salisbury.

## SCHEDULE OF CHARGES.

|  | £ | s. | d. |
|--|---|----|----|
| 1. Partial analysis of a manure or feeding stuff,<br>for each constituent ... ..                               | 0 | 5  | 0  |
| 2. Complete analysis and valuation of a manure<br>or feeding stuff ... ..                                      | 1 | 0  | 0  |
| 3. Analysis of agricultural products, <i>e.g.</i> , grain,<br>hay, roots, etc. ... ..                          | 1 | 0  | 0  |
| 4. Analysis of water for agricultural purposes,<br>irrigation or drainage ... ..                               | 1 | 5  | 0  |
| 5. Partial analysis of soil to determine fertility<br>and recommendations as to manurial treat-<br>ment ... .. | 2 | 0  | 0  |
| 6. Complete analysis of a soil ... ..  | 3 | 0  | 0  |
| 7. Milk—determination of total fat and solids ...  | 0 | 5  | 0  |
| do. do. of fat only ... ..   | 0 | 2  | 6  |
| do. complete analysis ... ..   | 0 | 10 | 0  |
| 8. Cream—determination of fat only ... ..  | 0 | 2  | 6  |
| do. complete analysis ... ..   | 0 | 10 | 0  |
| 9. Analysis of cheese ... ..   | 0 | 10 | 0  |
| 10. Limestone—Estimation of percentage of lime   | 0 | 5  | 0  |
| do. complete analysis ... ..   | 1 | 0  | 0  |



Remittances should accompany samples submitted.

No charge will be made where the material forwarded is considered by the Director of Agriculture and Chemist to be of sufficient general interest.

#### DIRECTIONS FOR TAKING SAMPLES OF SOIL.

It is recommended to select four or five spots at least per acre, taking care that these represent as far as possible the general character of the area to be reported upon. If the soil of the area presents notable differences, the samples gathered from the different parts must be kept separate.

Having selected a proper spot, pull up the plants growing upon it, and remove surface accumulations of decaying leaves, etc., if any. Dig a hole about twelve inches deep, and trim one side so as to be smooth and vertical. From the side so prepared, remove with the aid of a sharp spade a slice of uniform thickness—about three or four inches—down to a depth of nine inches. Place the slice on a clean board or cloth, and mix thoroughly with similar slices obtained in the same way from other parts of the area. About six pounds of the mixture are then placed in a clean cloth bag or wooden box. Forward with the samples the following particulars:—Date of collection, exact location, position (hill side, vlei or flat), peculiarities of soil and sub-soil, behaviour in wet and dry seasons; if cultivated, state crops borne; previous manurial treatment, if any; and any circumstance in fact which will throw light on its agricultural qualities.

A sample of the second nine inches from the surface should be taken in the same way.

## The Agricultural Outlook.

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The condition of crops and stock in Mashonaland is generally very satisfactory. Farmers in this part of the Territory are increasing their winter crops, and consequently local markets have not to rely as much as has previously been the case upon supplies from outside the country. Tobacco planters are preparing their seed beds and hoping for early rains to permit of transplanting. Light rains have been fairly general throughout the Province, and have improved the veld. Most farmers cut hay in the early part of the season, and are in a position to weather a drought should it unfortunately occur. The majority of farmers are increasing their acreage, and many have their lands broken up, the doctrine of early ploughing having many converts in Mashonaland.

Stock in Matabeleland are reported to be in good condition and doing well, though in some parts the grazing is rapidly deteriorating. Farmers are everywhere purchasing pedigree bulls to cross with native cattle. One farmer in the Gwelo district, who has been doing this for some years, has sold some of the progeny to the amount of £1,200 in twelve months.

Messrs. Liebig & Company continue to open up their holding, making good roads, fencing, etc., and generally improving the country. They have at present over 12,500 head of cattle on their ranch.

It is interesting to note that it has been decided to hold a district agricultural show at Plumtree after the Bulawayo show. The Marula Association have agreed to co-operate, and a committee has been elected to make all the necessary arrangements.

Throughout the Territory there is every indication of an early season. It is gratifying to note that grass fires have been much less in evidence this year, and it is evident that the new Ordinance is bearing good fruit.



## Correspondence.

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### BEE-KEEPING.

To F. Swarder, Esq.

Sir,

I take the liberty of writing to you, as I believe you are looked upon as the Bee Expert of Mashonaland.

Will you kindly answer the following questions?

(1) Are the wild bees too savage to work with? I always understood they were pretty bad until I saw a boy rob some wild nests, and they then seemed as well behaved as English bees, with such primitive instruments and no protection.

(2) How am I to get wild bees out of a nest to put into a bar frame hive?

(3) Is the W.B.C. hive suitable for this country? I should imagine the double wall would make the coolest hive.

(4) Could you give me the measurements, as I wish to make my own hives?

(5) Have the hives to be stood in tins of water to keep the ants away?

I kept a couple of hives for about a year at Home, so know a little about bees.

Thanking you in anticipation (quote number of question only),

I am, etc.,

Wm. N. G.

## REPLY.

Mr. Swarder replied—

(1) The Rhodesians are not so docile as the English bees, but if reasonable precautions are taken they can be handled. In most cases a veil is essential, also a smoker and the carbolic cloth, for subduing them. In my own apiary I have worked with them for three years, having also removed them from various places, such as a railway truck, the side of a house, and the side of a kafir hut, also the boarded floor of a bedroom, in every case with success.

(2) You do not state if the bees are located in a tree or a hole in the ground. If in the former, cut away a portion of the wood below the nest, previously blowing in smoke at their entrance. As soon as the hole which you have made is sufficiently large to get the spout of the smoker into it, blow in smoke; this will not only help to subdue the bees, but will also tend to make them clear upwards towards their entrance. Should these measures fail, provide yourself with a 1s. 6d. bottle of Calvert's No. 5 carbolic acid, then saturate a piece of cloth with this mixture and insert it into the hole below the nest. The bees will soon clear out. Do this about 10 o'clock in the morning at this season, but earlier in summer. When the bees clear out, they will be gorged with honey; watch where they fly to. At this time of the year they can be hived in an ordinary box as a temporary home, and in the evening carried where you wish them to remain. Provide yourself with a convenient sized box with a lid. On arrival at the spot, remove the lid and turn the box upside down, placing the lid sloping upwards to the impromptu entrance. If the bees are in a hole in the ground freely smoke the bees first, then dig away the earth and expose the combs so that you are able to cut them away; shake the bees off these combs on to the board, and they will readily run up into the box. Keep the box inverted, and, with a piece of cord, tie the lid to the bottom of the box, and carry them home in this position, placing them where you wish them to remain, and feed them with white moist sugar dissolved in hot water. This food should be given quite warm; cover everything up with warm clothing. If you already have a frame hive fitted with full sheets of foundation, on arrival



home you can shake the bees from the box on to the alighting board of the hive, as in hiving a swarm.

(3) The W.B.C. hive is one of the best for this climate, as the temperature is kept uniform, but it is the most expensive; this is due to the extra quantity of wood and labour required in its manufacture.

(4) Your best plan is to write to the Manager, British Bee Journal Office, 23, Bedford Street, Strand, London, W.C., England, for a copy of the British Bee-Keepers' Practical Note Book, costing 1s. 1d. post free. In it will be found a description of the W.B.C. hive and how to make it; also its measurements.

(5) In my own apiary I find it absolutely essential to stand the legs of the hives in tins of water, in order to keep ants away.

Seeing that you have kept bees for a little while in England, I have not entered into minute details regarding feeding. I am still contributing articles on bee-keeping to the *Rhodesia Agricultural Journal*, in which you may find useful hints applicable to this country. I shall be pleased to answer any further questions which may be beneficial to you, and, provided you adopt reasonable care, you should succeed.

# Veterinary Report.

July, 1913.

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## SALISBURY.

AFRICAN COAST FEVER.—At the Hatfield Estate infected area three animals were destroyed as affected with Coast Fever.

TUBERCULIN TEST.—Fifteen heifers and one bull, imported by the B.S.A. Company (Estates Department) from England, were tested, with negative results.

REDWATER AND GALLSICKNESS INOCULATION.—The 16 head above referred to and six Colonial pure-bred Shorthorn bulls were inoculated.

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## BULAWAYO.

AFRICAN COAST FEVER.—There were no fresh cases during the month at the infected centre, Collaton.

MALLEIN TEST.—The following animals were tested with mallein on importation (includes Plumtree and Gwanda):—Horses, 178; mules, 76; donkeys, 148. Three horses gave suspicious reactions and were placed in quarantine.

HORSESICKNESS INOCULATION.—Nineteen mules inoculated; one death.

TUBERCULIN TEST.—Nine head of cattle tested; no reactions.

IMPORTATIONS.—Heifers, 990; bulls, 126; sheep and goats, 5,449.

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## UMTALI.

AFRICAN COAST FEVER.—At the infected centre, N'Odzi, the mortality was very high, notwithstanding the three-day



dipping of all animals and the weekly dressing of the ears of the cattle; 35 animals were destroyed, bringing the total mortality to 92. A veterinary inspection of all the cattle in the Northern Umtali and Southern Inyanga areas was carried out. No trace of any infective disease or mortality from any cause was discovered.

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### INYANGA AND MAKONI.

One outbreak of scab in native stock reported from each of these districts, otherwise all stock healthy.

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### SELUKWE.

Three outbreaks of scab amongst native sheep and goats reported.

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### VICTORIA.

MALLEIN TEST.—The following animals *ex* Transvaal were tested and found healthy:—Horses, 4; mules, 2; donkeys, 79.

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### MELSETTER.

MALLEIN TEST.—One donkey from Portuguese territory was tested with mallein and found healthy.

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All other districts reported healthy.

J. M. SINCLAIR,

Chief Veterinary Surgeon.

## Veterinary Report.

### August, 1913.

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#### SALISBURY.

AFRICAN COAST FEVER.—*Existing Outbreak.*—On the Hatfield Estate infected area, eight head were destroyed as affected with Coast Fever.

*Fresh Outbreak.*—On 7th August a young heifer in Mrs. Krienke's herd at the Kopje, Salisbury Commonage, died. *Post-mortem* and microscopical examination shewed the existence of Coast Fever; on the 21st a young calf was found to be affected and was destroyed.

TUBERCULIN TEST.—The following animals, imported from England, were tested with tuberculin, with negative results:—6 bulls and 6 heifers, Hunyani Tobacco Plantation and Amalgamated Properties; 33 bulls and 8 heifers, Department of Agriculture. One heifer in the consignment belonging to the B.S.A. Company which arrived in June reacted to a second test and was destroyed.

REDWATER AND GALLSICKNESS INOCULATION.—Of the B.S.A. Company's June consignment, three heifers died as the result of inoculation, also one bull belonging to Mr. Farmer; of the July consignment, one heifer died. The six Colonial-bred Shorthorn bulls shewed good reactions, and made satisfactory recoveries.

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#### BULAWAYO.

AFRICAN COAST FEVER.—No fresh cases at the existing centre of infection at Collaton.

MALLEIN TEST.—The following animals were tested on importation, with negative results (includes Gwanda and



Plumtree):—Horses, 90; mules, 144; donkeys, 341. The three horses referred to in last month's report were re-tested, gave positive reactions, and were destroyed. *Post-mortem* examination shewed lesions of glanders in each case.

HORSESICKNESS INOCULATION.—Tested, 25 mules; deaths, 3.

TUBERCULIN TEST.—Two heifers and one bull were tested on importation from England and found healthy.

IMPORTATIONS.—Heifers, 2,099; bulls, 59; sheep and goats, 3,864; ostriches, 4.

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### UMTALI.

AFRICAN COAST FEVER.—A marked decrease in the mortality occurred at the farm N'Odzi; 6 animals were destroyed during the month, as compared with 35 during July. Total mortality to date, 98.

HORSESICKNESS INOCULATION.—Three mules treated without loss.

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### MAKONI.

SCAB.—One outbreak amongst native sheep and goats reported.

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### GWELO.

TUBERCULOSIS.—The *post-mortem* examination of an aged Friesland cow on a farm near Lalapanzi revealed advanced pulmonary tuberculosis. The existence of disease was confirmed microscopically. Enquiry was made into the history of the animal, and the following information was obtained:—The animal was sent from the Matobo district to the July cattle sales in Gwelo. She had been about four years in possession of the consignor, who had purchased her from a farmer in the

same district. At the time of purchase accelerated breathing and a cough were observed. It is probable, therefore, that the disease had existed for several years. The various animals which had been in immediate contact were inspected, and the tuberculin test applied to several, but without result.

HORSESICKNESS INOCULATION.—Thirteen mules treated without loss.

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### VICTORIA.

MALLEIN TEST.—The following animals *ex* Transvaal were tested with mallein and found healthy:—Horses, 1; donkeys, 87.

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All other districts reported healthy.

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SPIROCHÆTOSES IN AN ELEPHANT.—In smears taken from an elephant, shot by Mr. G. M. McCulloch in Mafungabusi district, spirochætes were found.

J. M. SINCLAIR,

Chief Veterinary Surgeon.



## Market Reports.

### 23rd August, 1913.

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The produce market in Salisbury is well supplied with all lines. Potatoes are plentiful, and prices are much lower than is customary at this time of the year. The mealie market is very flat, and large quantities of maize are on sale. There has not been much local butter forthcoming up to the present, but supplies are now beginning to come in more readily. Eggs are plentiful. There is a big demand everywhere for trek oxen, while enquiries for breeding stock are keener than ever. We are indebted to Messrs. Wightman & Co. for prices of produce at Salisbury and Bulawayo.

There have been fairly frequent stock sales during the last two months, and prices generally have been good. At Hartley, Messrs. Whitfield & Co. disposed of 600 head, at prices ranging from, cows, £8 to £15; oxen, £10 10s.; heifers, £6 to £9. Native heifers were sold at from £5 5s. to £7 10s. At Macheke the same firm sold 450 head, the property of Mr. H. Williams. Cows fetched from £9 to £10, and trained oxen from £10 10s. to £12 7s. 6d. At Marandellas, on the 13th August, Mr. Sam Lewis disposed of some 500 head at the following prices:—Ordinary Mashona cows, £8 to £10; good half-bred cows, £15 to £20; Colonial heifers, £9; local heifers, £7 10s. to £9; trek oxen, 3 years old, £8 10s.; trek oxen, 4 year old, £9 10s.; trek oxen, 5 years old, £11 15s.; mules, £25 to £27 10s.; horses, £8 15s. to £37 10s.; donkeys, £6 to £12; tollies, £4 10s. to £6.

Mr. J. G. Hunt had a sale at Makwiro on the 9th September, when 147 head were disposed of. Slaughter oxen fetched from £12 to £13; trek oxen from £7 17s. 6d. to £10; native cows from £7 to £10; heifers, £6 10s. to £8; sheep, £1 3s.; goats, 14s. 6d.

| Article.                         | Johannesburg. |      | Kimberley. |      | Bulawayo. |      | Salisbury. |      |
|----------------------------------|---------------|------|------------|------|-----------|------|------------|------|
| Barley, 150 lbs.                 | 12/6          | 15/0 | 12/6       | 13/6 | 26/0      | 28/0 | 32/6       | 35/0 |
| Beans, 203 lbs.                  | 17/0          | 28/6 | 29/0       | 36/0 | 35/0      | 40/0 | 24/0       | 27/6 |
| Boer Meal, unsifted,<br>200 lbs. | —             | —    | 25/6       | 28/6 | 40/0      | 42/0 | 38/6       | 40/0 |
| Bran, wheaten, 100 lbs.          | 7/6           | 8/6  | 8/0        | 8/6  | 12/6      | 14/0 | 17/0       | 18/6 |
| Flour, 100 lbs.                  | —             | —    | —          | —    | 21/0      | 24/0 | 23/6       | —    |
| „ Colonial, 100 lbs.             | —             | —    | 16/0       | 16/3 | —         | —    | 20/0       | —    |
| Forage, 100 lbs.                 | 5/9           | 6/3  | —          | —    | 10/6      | 11/6 | 8/0        | 8/6  |
| „ Colonial Oat                   | 5/6           | 6/0  | 5/9        | 6/0  | —         | —    | —          | —    |
| Hay                              | 1/0           | 2/0  | —          | —    | 60/0      | 75/0 | 45/0       | 50/0 |
| Kaffir Corn, 200 lbs.            | 17/6          | 20/3 | 18/0       | 20/0 | 24/0      | 26/0 | 18/0       | 18/6 |
| Manna, 100 lbs.                  | 1/0           | 6/6  | —          | —    | none      | —    | 4/0        | 5/0  |
| Mealies, S.A. White,<br>203 lbs. | 12/2          | 12/6 | 12/6       | 13/6 | 15/6      | 16/0 | 12/0       | 13/0 |
| Mealies, Yellow, 203 lbs.        | 8/0           | 10/0 | —          | —    | 15/0      | 15/6 | none       | —    |
| Mealie Meal, White,<br>183 lbs.  | —             | —    | 13/6       | 14/0 | 15/0      | 15/6 | 12/6       | 13/6 |
| Munga, 200 lbs.                  | —             | —    | —          | —    | none      | —    | 22/6       | 25/0 |
| Monkey Nuts, bag                 | 100 lbs.      | —    | —          | —    | 70 lbs.   | —    | 10/6       | 11/6 |
| Oats, 150 lbs.                   | 9/0           | 12/3 | 11/6       | 11/9 | 18/6      | 20/0 | 26/6       | 27/6 |
| Onions, 120 lbs.                 | 13/0          | 14/6 | 10/6       | 15/0 | 22/0      | 23/0 | 27/6       | 30/0 |
| Peas, 200 lbs.                   | —             | —    | —          | —    | none      | —    | 40/0       | 45/0 |
| Potatoes, new, 150 lbs.          | 10/6          | 13/0 | 12/6       | 22/0 | 22/6      | 23/6 | 15/6       | 18/6 |
| „ old, 150 lbs.                  | —             | —    | —          | —    | none      | —    | —          | —    |
| Rapoko                           | —             | —    | —          | —    | 22/6      | 23/6 | 15/6       | 17/6 |
| Rye, 200 lbs.                    | —             | —    | —          | —    | —         | —    | none       | —    |
| Salt, 200 lbs.                   | 3/6           | 4/0  | 3/0        | 4/0  | 10/0      | 11/0 | 12/6       | 13/0 |
| Wheat, 203 lbs.                  | 24/0          | 26/6 | 21/0       | 24/0 | —         | —    | none       | —    |
| Butter, local, per lb.           | —             | —    | 1/2        | 1/4  | —         | —    | 2/0        | —    |
| Eggs, local, per dozen           | 10d.          | 1/0  | 9d.        | 1/3  | 1/9       | 2/0  | 2/3        | 2/6  |
| Ducks, each                      | —             | —    | 3/0        | —    | 3/0       | 4/0  | 3/6        | 4/6  |
| Fowls, each                      | —             | —    | 1/9        | 2/6  | 2/6       | 3/6  | 3/6        | 4/6  |
| Geese, each                      | —             | —    | —          | —    | 4/0       | 5/6  | 7/0        | 10/0 |
| Turkeys, cocks, each             | 8/6           | 16/0 | 4/0        | 10/6 | 8/0       | 9/0  | 15/0       | 17/6 |

## LIVE STOCK.

|                            |       |       |       |       |       |        |       |        |
|----------------------------|-------|-------|-------|-------|-------|--------|-------|--------|
| Slaughter Cattle, 100 lbs. | 32/6  | 40/0  | £10   | £14   | 38/6  | 40/0   | 40/0  | —      |
| Trek Oxen, trained         | £7    | £9/10 | £7/10 | £8/10 | £8/10 | £12    | £10   | £12/10 |
| Local Cows, milk           | £15   | £22   | £8    | £12   | £20   | £32    | £17   | £20    |
| Dairy Cows                 | £16   | £26   | —     | —     | £25   | £35    | £25   | £30    |
| Native Cows                | —     | —     | —     | —     | £7    | £10    | £8    | £10    |
| Heifers, Colonial          | £5/10 | £7/10 | —     | —     | £8    | £15    | £8/10 | £9/10  |
| „ Native                   | —     | —     | —     | —     | —     | —      | £5    | £7/10  |
| Pigs, live weight          | 2d.   | 4½d.  | 3½d.  | —     | 3d.   | 4d.    | 4d.   | —      |
| Horses, riding, salted     | —     | —     | —     | —     | £35   | £70    | £30   | £40    |
| „ „ unsalted               | £15   | £20   | £10   | £25   | £20   | £35    | £20   | £30    |
| Mules, inoculated          | £25   | £35   | £18   | £25   | £35   | £40    | £25   | £30    |
| Donkeys, geldings          | £5    | £6    | £5    | £7    | £7    | £8/10  | £7/10 | £8     |
| „ mares                    | —     | —     | £6    | £7/10 | £8/10 | £10/10 | £8/10 | £10    |
| Goats                      | 10/0  | £1    | 10/0  | 12/6  | 11/0  | 13/6   | 12/6  | 15/0   |
| Persian Ewes               | —     | —     | —     | —     | —     | —      | 20/0  | 23/6   |
| Cross-bred Ewes            | —     | —     | —     | —     | —     | —      | —     | —      |
| Sheep, slaughter           | 5d.   | 6d.   | —     | —     | 21/0  | 23/0   | 20/0  | 22/6   |



## Garden Calendar.

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By N. L. KAYE-EDDIE.

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### FLOWER GARDEN.

*October.*—All flower seeds, annual and perennial, may be sown as in September. A word or two on open seed beds may not be out of place here. These beds should be prepared in a sheltered position, and the soil should be well and deeply dug. This is more essential than at first thought, as in this state the soil when once watered is more easily kept moist, and is not so liable to cake. The top dressing should be free from all undecayed vegetable matter and, when sown, the seeds should be covered with a thin dressing of fine light soil, over which a thin covering of grass may be placed to keep off evaporation.

Transplanting from boxes or beds should be done on a dull day or towards evening; the plants should be well watered before being removed, and the roots disturbed as little as possible, care being taken that the latter have their full depth and spread when planting.

*November.*—All seeds may now be planted. Annuals for January flowering should be sown, amongst which the following will be found to do excellently in this country:—Balsam, Calliopsis, Centurias, Chrysanthemum, Dianthus, Eschscholtzia, Marigold, Mignonette, Gallardia, Phlox, Poppy, Nasturtium, Nigella, Verbena, and Zinnia. These are all hardy, and may be sown in the open either in beds or in the position desired for flowering. Advantage should be taken of each shower of rain during this month to keep the soil well worked and loose.

## VEGETABLE GARDEN.

*October.*—As in September, nearly all vegetable seeds may be sown. Early potatoes should be earthed up when reaching the height of about eight inches. In planting a small amount of marrow, melon, cucumber, and pumpkin, the writer has found it economical to sow the seed one in a tin and transplant when about four inches high in hills. A few cucumbers planted in this manner yielded nearly 400 a week for about two months. Sweet corn and mealies may also be sown this month.

*November.*—All vegetable seeds may be sown during this month. Tomatoes and early peas and beans should be staked. The soil should be kept loose and free from weeds, which now get troublesome.

Sow pumpkin, mealies, peas, and potatoes.



# Weather Bureau.

## TEMPERATURES.

| STATION                           | JULY |      | AUGUST |      |
|-----------------------------------|------|------|--------|------|
|                                   | Max. | Min. | Max.   | Min. |
| <b>MASHONALAND—</b>               |      |      |        |      |
| Hartley, Giant Mine ...           | 76·9 | 43·0 | —      | —    |
| „ Hallingbury Farm ...            | 76·8 | 38·4 | 80·9   | 42·8 |
| Lomagundi, Sinoia ...             | 78·7 | —    | 82·4   | —    |
| Mangwendi, Huish ...              | 72·3 | 43·0 | 76·3   | 44·8 |
| Melsetter, Government Offices ... | 69·7 | 46·9 | 72·4   | 46·7 |
| „ Mount Selinda ...               | 73·2 | 45·9 | 76·2   | 48·6 |
| Salisbury, Agricultural Laborat'y | 71·7 | 41·3 | 75·9   | 44·4 |
| „ Chishawasha ...                 | 73·8 | 41·0 | 76·9   | 44·3 |
| „ The Gaol... ..                  | 75·0 | 39·4 | 78·8   | 43·4 |
| „ Shamva Mine ...                 | —    | —    | —      | 49·8 |
| Umtali, Chiconga's Location ...   | 73·8 | 41·2 | —      | —    |
| „ Summerfield ...                 | 70·4 | 45·8 | 70·8   | 46·6 |
| Victoria ... ..                   | 75·1 | —    | 77·6   | —    |
| <b>MATABELELAND—</b>              |      |      |        |      |
| Bulawayo, Essexvale ...           | 78·4 | 41·9 | 81·3   | —    |
| „ Observatory ...                 | 73·5 | 43·3 | 77·0   | 46·9 |
| „ Rhodes Matopo Park... ..        | 76·6 | 42·6 | 81·1   | 47·7 |
| Gwelo, The Gaol ... ..            | 75·1 | 42·8 | 78·7   | 46·9 |
| Mangwe, Empandeni ... ..          | 79·4 | 42·8 | 82·2   | 47·0 |
| Tuli, Police Camp ... ..          | 83·1 | 44·3 | 87·7   | 50·1 |

## RAINFALL.

Light rains fell fairly generally throughout Mashonaland at the end of August. The Meteorological Office report is as follows:—

Charter District.—Light rains in southern and northern portion.

Hartley District.—Light rains, from .03 inch to .50 inch, general throughout the district.

Makoni.—Light rains at Rusapi and Chimbi Source.

Mangwendi.—Light rains in south-eastern portion.

Melsetter.—Light rains fairly general.

Salisbury.—Light rains in and around town.

Umtali.—Light rains in the north.

Victoria.—Light rains in the north.

### MATABELELAND.

Belingwe.—Very light rains in isolated parts.

Bubi.—Good shower at Inyati; rest of district dry.

Bulawayo.—Shower at Lochard.

Gwelo.—Light rains at Lower Gwelo and Shawlands.

From all the other stations throughout Rhodesia no rain has been reported during July and August, this being the normal dry period of the year.

# Dates of Meetings of Farmers' Associations, Southern Rhodesia

(SUBJECT TO ALTERATION)

| Name of Association              | Place of Meeting   | Secretary            | 1913 |      |      |
|----------------------------------|--|----------------------|------|------|------|
|                                  |  |                      | Oct. | Nov. | Dec. |
| Bindura                          | Thurlow's Hotel  | S. E. Ford           | ..   | 8    | ..   |
| Charter—Mgezi                    | Beatrice Mine  | W. Krienke           | ..   | 26   | ..   |
| Central                          | Unvuma   | C. Napier            | 31   | 28   | 30   |
| Enterprise                       | Arcturus Hotel   | R. Philip            | 14   | 11   | 9    |
| Figtree Branch, R.L. and F.A.    | Figtree Hotel  | A. Curtis            | ..   | 8    | ..   |
| Gatooma                          | Gatooma  | R. F. Thomas         | ..   | ..   | ..   |
| Gazaland                         | Chippinga  | L. Dobeil            | 30   | ..   | ..   |
| Greystone                        | Roodeneuvel  | J. W. Spencer        | 11   | 8    | 13   |
| Hartley                          | Commercial and Fiander's Hotels,<br>Hartley, alternately | ..                   | ..   | ..   | ..   |
| Headlands                        | Headlands  | L. Savory            | 11   | 8    | 13   |
| Insiza                           | Insiza   | H. Barnes Pope       | 4    | 29   | ..   |
| Lalapanzi                        | Lalapanzi Hotel  | N. C. St. J. Breslin | 4    | ..   | ..   |
| Lomagundi                        | Sinoia   | B. Shit              | 17   | 14   | 19   |
| Macheke                          | Macheke  | J. N. Bateman        | ..   | 15   | ..   |
| Makoni                           | Rusape   | H. H. Kidson         | ..   | 1    | ..   |
| Makwiro                          | Makwiro  | W. S. Tapson         | 4    | 1    | 6    |
| Manica                           | Christinas Pass Hotel                                    | A. B. Fraser         | 18   | 15   | 20   |
| Marandellas                      | Marandellas  | J. S. Holland        | 4    | 1    | 6    |
| Mangwendi                        | Fixed every meeting                                      | E. P. de Kock        | 4    | 1    | 6    |
| Marula                           | Marula Siding  | ..                   | 25   | 22   | ..   |
| Mashonaland                      | Salisbury  | MacW. Ingram         | 4    | 1    | 6    |
| Matopo Branch, R.L. and F.A.     | Matopo Hotel   | W. H. Williamson     | ..   | ..   | ..   |
| Mazoe                            | Various Farm Houses                                      | W. E. Dowsett        | ..   | ..   | ..   |
| Melsetter (North)                | Various Farm Houses                                      | F. C. Peek           | ..   | ..   | ..   |
| Midlands                         | Various Farm Houses                                      | N. N. Rutherford     | ..   | ..   | ..   |
| Northern                         | Gwelo  | H. K. Pinches        | ..   | ..   | ..   |
| Plumtree                         | Farm "Summerfield"                                       | R. W. H. Blurton     | ..   | ..   | ..   |
| Que Que                          | Plumtree   | H. J. Brooke         | 11   | 8    | 13   |
| Rhodesian Landowners and Farmers | Que Que  | E. E. Somerset       | 18   | 15   | 20   |
| Shamva                           | Bulawayo   | H. S. Hopkins        | 31   | 28   | 26   |
| Selukwe                          | Shamva   | J. M. Moubray        | ..   | ..   | ..   |
| Somabula and Shangani Flats      | Selukwe  | F. S. Clark          | ..   | ..   | ..   |
| Unvukwe                          | Farm "Fairview"  | S. Annandale         | ..   | ..   | ..   |
| Victoria                         | Farm "Ruia"  | J. S. Parker         | 4    | 1    | 6    |
|                                  | Victoria   | J. Rutherford        | 11   | ..   | ..   |



## Departmental Notices.

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### Information for Farmers

The Department of Agriculture is prepared to furnish to farmers technical advice either by correspondence, or, where possible, by personal visits. All communications should be addressed in the first instance to the Director of Agriculture.

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### Crops

The Agricultural Branch deals with enquiries relating to agricultural practice, soils, crops, cultural operations, processes, seeds, trees, farm implements and machinery, etc.

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### Poisonous Plants

It is of great importance that as soon as possible a study should be made of those plants found in Southern Rhodesia which are poisonous or deleterious to small or large stock. Farmers and others who have known, or suspected poisonous plants on their property, are requested to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, at the same time forwarding specimens of the plant, including stem, leaves, flowers, and, where possible, fruit. Any particular regarding the habits of the plant will be welcomed, and in return the Department will supply all available information regarding the plants.

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### Disposal of Seeds

All farmers and others who have surplus supplies of good quality locally grown farm seed of any description are invited to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, stating what

quantities are available for sale, and price f.o.r. nearest station. In all cases representative samples of the grain must accompany the letter, but need not exceed two ounces in weight.

The Agricultural Department is continually receiving enquiries as to where various seeds can be obtained, and it is hoped that by the above means growers of reliable seed may be brought into touch with one another.

It must be clearly understood, however, that beyond recommending sources of supply, the Department cannot take any further part in the transaction.

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### **Tobacco**

The services of the Tobacco Expert are available to all desiring advice on the subject. Applications should be accompanied by particulars of the nature of the information sought, also the distance and direction of the farm from some well known centre.

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### **Live Stock**

The Animal Industry Branch is prepared to advise with regard to all matters connected with stock breeding, selection, feeding and registration of stud animals, the dairy industry, poultry management, farm buildings for stock, and kindred subjects. Buyers and sellers of stud stock in Rhodesia are also put in touch with one another.

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### **Purchase of Stock in the Cape and Free State Provinces of the South African Union, on behalf of Farmers resident in Southern Rhodesia**

The following amended arrangements are published for general information :—

The Government undertakes the purchase of pure-bred live stock for farmers on the conditions outlined below, and on the following terms of payment, viz. :—(1) a deposit on application; (2) one-third total cost on delivery, less amount of

deposit; (3) one-third after six months, and (4) one-third after twelve months—both these instalments bearing interest at 6 per cent. or 10 per cent. if not paid at due date. These terms of credit will only be allowed on purchases up to a total maximum value of £200; sums exceeding that amount are payable in cash along with the first instalment. The Government reserves the right to refuse, without reason given, applications, or to fulfil purchases even after deposit has been made. Applications must be on the prescribed Form "A," and all conditions complied with before same is registered. Applications will be considered in rotation, but fulfilled as opportunity serves, so that animals may be procured as cheaply as possible. The buyer must undertake to accept the animal allotted to him, unless it fails to satisfy description as given in the application form. Disputes may be submitted to arbitration. The purchase price will include all expenses up to time of delivery, price paid to original owner, commission and charges of buyer and freight, including, where necessary, attendance and keep on journey. With every application a deposit must be forwarded; £1 per head in the case of cattle, horses and donkeys, and 5s. per head for sheep, goats and pigs. Such deposit will be deducted from the amount of the first instalment due, but may be forfeited in the event of the application being withdrawn after having been registered. Stock is not to be disposed of without the written consent of the Director of Agriculture until payment is completed.

Purchases will be made by the Department of Agriculture through its authorised representatives. Every effort will be made to secure animals in accordance with particulars furnished by applicants, and to the best advantage. All purchases must conform strictly to the importation regulations as regards age and freedom from contact with contagious disease. Pedigrees, if obtainable, will be supplied. The Government will bear all risks of transport and of death from any cause until delivery, all losses being chargeable to the vote. All animals failing to pass the necessary test on arrival shall be destroyed and the loss borne by the Government, and another animal purchased for the applicant.

Prospective buyers will be advised of the probable cost. The Department does not undertake to purchase stock at precisely the prices specified by applicants, but will endeavour to



approximate as nearly as possible to the figures given and not to exceed same by over 20 per cent. The authorised representatives of the Department will be allowed a reasonable commission, with expenses additional.

The first instalment will become due and payable on delivery. Applicants or their agents will be advised regarding arrival of their stock, after which all responsibility on the part of the Department will cease.

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## Entomology

The Government Entomologist advises on matters connected with insect pests of live stock, crops, and fruit trees, and also undertakes the inspection of nurseries and of the importation of plants from abroad.

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## Chemical Analyses

The Government Agricultural Chemist deals with matters relating to the composition of soils, fertilisers, farm produce of vegetable or animal origin; also the investigation of poisons and of articles of potential economic value.

Nominal charges are made, which, while not covering the cost, will help to defray the expense and serve as a proof of good faith. Samples, carriage prepaid, together with full particulars regarding the subject should be addressed to the Agricultural Chemist, Department of Agriculture, Salisbury.

A schedule of charges and directions for taking samples will be furnished on application.

With all analyses, reports will be furnished explanatory of the results and, when possible, advice given as to the nature, properties and value of the material.

No charge will be made for analysis where the material forwarded is considered by the Director of Agriculture and Chemist to be of sufficient general interest.

## Services of Government Veterinary Surgeons

1. The services of Government Veterinary Surgeons are available to the public, free of charge, for the following purposes only :—

- (1) Attending and giving professional advice in connection with the following diseases, viz. :—Anthrax, Contagious abortion, East Coast Fever, Epizootic Lymphangitis, Foot and Mouth Disease, Farcy, Foot-rot, Heartwater, Glanders, Intestinal parasites amongst sheep and goats, Liver Disease, Lungsickness, Osteo Porosis, Malarial Catarrhal Fever (blue tongue), Rabies, Redwater, Rinderpest, Scabies, Sponziecte (quarter evil), Swine Fever, and any other diseases which may in future be scheduled in terms of section 3, sub-section 18 of the “Animals Diseases Consolidation Ordinance, 1906.” Attending to cases of disease amongst live stock which, though not of a contagious or infectious character, may be of general public importance.

- (2) Applying tests in regard to Glanders, Tuberculosis, or any other disease against the introduction or spread of which tests are applied under regulations.

- (3) Inoculations against the following diseases :—

Horsesickness, Lungsickness, Anthrax, Quarter Evil, Redwater, Malarial Catarrhal Fever (blue tongue). A fee to cover the cost of serum and virus will be charged.

2. The following charges shall be made and payable for services rendered by the Government Veterinary Surgeons in other cases, viz. :—

|   | £ | s. | d. |
|---|---|----|----|
| (1) For every professional visit within three miles of his office or residence ... ..                 | 0 | 5  | 0  |
| (2) For every professional visit beyond such distance ... ..  | 0 | 10 | 6  |
| plus an additional charge of 2/6 per hour whilst engaged in such visits or £2/2/0 a day of 24 hours ; |   |    |    |

|   | £ | s. | d. |
|---|---|----|----|
| (3) For advice given at the Veterinary Surgeon's office, for each animal, per visit | 0 | 2  | 6  |
| (4) The following to be charged in addition to visiting fees :—                     |   |    |    |
| <i>a.</i> For every examination as to soundness, each ... ..                        | 1 | 1  | 0  |
| <i>b.</i> For castration, horses, each ... ..                                       | 1 | 1  | 0  |
| <i>c.</i> For castration, bulls, each .... ..                                       | 0 | 5  | 0  |
| <i>d.</i> For castration, donkeys, each.. ...                                       | 0 | 10 | 6  |
| <i>e.</i> For parturition cases, mares, each  | 2 | 2  | 0  |
| <i>f.</i> For parturition cases, cows, each..                                       | 1 | 1  | 0  |
| <i>g.</i> For other operations, according to nature, from 5/- to £2/2/0.            |   |    |    |

3. Double the above fees will be payable for services rendered on Sundays, public holidays, and between the hours of 7 p.m. and 7 a.m.

4. Applicants for the services of Government Veterinary Surgeons must at their own cost provide the necessary transport for the conveyance of these officers from, and back to, their residence or nearest railway station.

5. Farmers and owners of stock throughout the country frequently telegraph for a Government Veterinary Surgeon to be sent to attend an animal which has been taken seriously ill. It is rarely possible to comply with these requests at once, as the Veterinary Surgeon may be engaged on duty which he cannot leave, or is at such a distance from where his services are required that he can hardly be expected to arrive in time to be of any service in an urgent case. Hence much valuable time is wasted, the owner of the animal is dissatisfied, and the veterinary staff discredited. To obviate this, in all cases where veterinary advice and assistance are required, the owner should telegraph to "Veteran," Salisbury, with prepaid reply, the nature of the complaint that the animal is suffering from, giving as full and accurate a description of the symptoms as possible. This will enable the Chief Veterinary Surgeon to



telegraph advice at once and state whether he is able to arrange for veterinary attendance on the case or not, and save valuable time, which is always of importance in acute cases.

6. The services of Government Veterinary Surgeons will only be available for private work with the consent of such officers, and when such work does not interfere with their official duties, or when the services of a private practitioner are not available.

7. As the arrangement of allowing Government Veterinary Surgeons to attend to private cases is intended purely for the benefit of farmers and stock-owners who may wish to obtain professional advice, no responsibility whatever will be accepted for any loss of stock, etc., which may result from the negligent treatment or advice, or wilful default, of any Government Veterinary Surgeon.

8. All fees collected in terms of these Regulations are payable to the Treasury through the local Receiver of Revenue.

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### **Sale of Dip**

With a view to enabling farmers to obtain dipping material at as low a rate as possible arrangements have been made whereby orders may be placed with any officer of the Veterinary Department for the purchase of supplies of Messrs. W. Cooper & Nephew's cattle dipping fluid, adapted for three-day, five-day or less frequent dipping. The price of the dip is 48s. 6d. per 10 gals., in not less quantities than that amount, delivered at any siding or station desired, in 5 gal. drums. Applications must be accompanied by remittances, without which they cannot receive attention. Remittances by cheque should be made in favour of Messrs. Meikle Bros., agents for the dipping fluid, commission being added, where necessary, to cover exchange. Coin or stamps will not be accepted. This dip is in use at all Government dipping tanks.

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### **Sale of Virus**

It is notified for public information that redwater and gall-sickness (*anaplasmosis*) virus may be obtained from the Veterinary Department, Salisbury, at a charge of ten shillings per dose.

Solutions of trypan blue and the injection used in the treatment of *trypanosomiasis* (fly disease) of cattle may also be obtained at a charge of five shillings per dose and blue tongue virus at one shilling and sixpence per dozen doses.

No material will be issued unless a remittance accompanies the order.

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## Irrigation

From the Agricultural Engineer assistance may be obtained by farmers for the following :—

1. In the locating of possible irrigation projects.
2. In the preparation of surveys or plans and for irrigation works, including weirs, dams, furrows, pumping plants, and determining the extent of land which may be brought under irrigation schemes, together with rough estimates of costs.
3. In the supervision of construction and carrying out of projects.
4. In the selection of suitable sites for boring operations.
5. Preparing specifications, etc., regarding pumping plants, windmills, and agricultural machinery.
6. Giving general advice on cognate subjects.

Informal advice of a general character will be given to applicants making enquiry by letter or in person. Any applicant desiring professional assistance likely to occupy more than one day should apply for advice in writing. All applicants should specify clearly the nature of the project on which they seek advice, and should give full particulars as to the distance and direction of their farms from some well-known centre. Applicants will be required to provide suitable means of transport for the officer concerned during the period devoted to work on the spot; to provide any unskilled labour that may be required; and to provide for any other contingent services. Applications should be addressed to the Director of Agriculture, who will endeavour to arrange visits as far as possible in order of application, but with due regard to situation, in order

to obviate unnecessary travelling and delay. The services of the Agricultural Engineer are given free, but in cases demanding prolonged individual attention, or repeated supervision, a charge may be made according to circumstances.

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## **Samples**

In connection with enquiries, especially with regard to diseases amongst crops, insect pests, soils, grain and the identification of plants, specimens should, wherever possible, be sent, together with full details. It is found that such parcels are often forwarded without any indication of where they are from or why they were sent and it is difficult in such cases to trace the sender. It is, therefore, requested that persons when forwarding samples for examination, indicate clearly their names and address on the package, so as to enable their requirements to be attended to without delay.

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## **Charges for Dipping Cattle at Government Dipping Tanks.**

On and after the 1st November, 1912, a charge of 1d. per head will be made in respect of all cattle dipped at Government dipping tanks.

Unweaned calves will be dipped free of charge.

Payment may be made in cash or by means of books of coupons at £1, 10/- and 2/6, which can be obtained from Civil Commissioners, Native Commissioners, or through all Veterinary Surgeons and Cattle Inspectors.

The tanks to which these provisions at present apply are the following :—

Salisbury (3), Bulawayo (3), Inyati, Umtali, Penhalonga, Melsetter, Marandellas, Macheke, Mazoe, Lomagundi, Hartley, Gwelo, Selukwe, Enkeldoorn, Victoria, Gwanda, Gatooma, Que Que, Umvuma, Kimberley Reefs.



## Lectures for Farmers

The services of certain of the officers of the Department of Agriculture and the Veterinary Department are available for purposes of delivering lectures on subjects upon which they have special knowledge. As far as practicable, lectures will be accompanied by demonstrations at the time or subsequently in the field. Owing to the many calls on the time of the staff and the exigencies of their duties, alternative dates are desirable in order to avoid disappointment. The following topics are offered as examples of subjects that may be dealt with in this manner, but the suggestion of other themes is invited.

*Agriculture.*—Maize growing; Maize selection and maintenance of the breeding plot; Points of maize and maize judging, with demonstrations; Utilisation of granite vlei soils; Ground nut culture; Rotation crops for home use and for sale; Veld improvement by winter grasses; Production of foodstuffs for the mines; Ensilage; Fungoid diseases of maize and wheat; Wheat, oats and lucerne under irrigation; The prospects of cotton culture in Southern Rhodesia.

*Veterinary Hygiene.*—Detection and prevention of disease; The care of live stock.

*Live Stock.*—Judging of cattle according to breeds, and for beef, milk and draught; feeding and kraaling of live stock; general principles of cattle breeding; management of imported stock; grading up of native or local stock with pure bred bulls.

*Dairying.*—Home butter-making; building and equipment of a farm dairy; handling and marketing of milk; packing and marketing of butter; construction of cow houses.

*Swine Husbandry.*—Breeding and feeding of swine; some suggestions for the production of first-class bacon pigs; construction of piggeries at moderate cost.

*Chemistry.*—The principles of soil fertility; the principles of manuring; the value of lime in agriculture; chemistry of milk and its products (accompanied by demonstrations in milk-testing).

*Entomology.*—Economic entomology on the farm; the role of insects and their allies in the transmission of disease;

scale insects and fruit trees and methods for their control; insect pests and maize; enemies of the potato, insect and fungus; the value and objects of plant import and nursery regulations.

*Irrigation.*—Methods of applying water to land for irrigation; the measurement of water in connection with irrigation; canal irrigation; storage reservoirs; hints on the selection of sites and on the design of earthen and other dams; irrigation by pumping, with notes on the selection of plants.

Enquiries and invitations should in the first instance be addressed to the Director of Agriculture, Salisbury.

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## Co-operative Experiments

*Distribution of Seed.*—The Department of Agriculture expects to have in stock the following seeds for distribution this season under the usual terms of Co-operative Experiments. Farmers anxious to test crops which have proved successful on the Experiment Stations, on a small scale before sowing more largely, are invited to send in their applications as soon as possible. The distribution is limited, and not more than three to five sorts can be sent to each applicant. The amount sent to any one farmer will depend on the number of applications received, but in any case, sufficient seed will be forthcoming to give the crops a fair trial.

Seed is issued f.o.r. Salisbury, and farmers are required to pay railway carriage. With the Agricultural Parcels Post Regulations now applicable this means of forwarding will be found cheaper and more rapid. Under these terms the seed is issued, on condition that the farmer co-operating *supplies at the end of the season a true report on the result of the experiments on forms supplied for that purpose.*

Applications should be addressed to the Government Agriculturist and Botanist, and, as far as possible, will be dealt with in the order received.

*Summer Wheat and Oats.*—Victoria Wheat, Sidonian Oats (early), New Zealand Oats (mid season), Algerian Oats (late).

*Other Summer Cereals.*—Boer Manna, Japanese Millet, Teff Grass.

*Leguminous Crops.*—Egyptian Clover, Velvet Beans, Cow-peas, Florida Beggar Weed, Vetches, Lucerne, Ground-nuts—Virginian and Spanish, Dhal.

*Root Crops.*—Mangels, Carrots, Chicory.

*Pasture Plants.*—Paspalum, Toowomba Canary Grass, Burnet, Tall Fescue, Cocksfoot, Brome Grass, Clover.

*Miscellaneous Crops.*—Linseed, varieties Castor Oil, varieties Cattle Melon, Sunflower, Rape, Thousand Head Kale, and Buckwheat.

### Sale of Seed Maize

Selected seed maize of the under-mentioned varieties, grown on the Government Experiment Farm, Gwebi, will be available for sale during the months of October and November.

|                 |     |     |     |     |         |
|-----------------|-----|-----|-----|-----|---------|
| Hickory King    | ... | ... | ... | ... | 8 row.  |
| Hickory King    | ... | ... | ... | ... | 10 row. |
| Salisbury White | ... | ... | ... | ... | 12 row. |

This seed is the outcome of four years' careful selection, and is offered for sale in limited quantities in order that farmers may be able to establish breeding plots on a reasonably large scale with seed which may be expected to breed true to type.

The price is 15s. per 100 lbs., free on rail, Salisbury, and applications should be addressed to the Government Agriculturist and Botanist, Department of Agriculture, Salisbury.

On account of the unexpectedly large demand, it will not be possible to supply more than a limited quantity to each applicant—probably not more than one bag in each case. This quantity will suffice to give each farmer a breeding plot from which to continue the selection of his seed for propagation on a larger scale the following season.

### Forestry: Sale of Trees.

The under-mentioned varieties of trees will be available for sale from December onwards. The price is 8s. 4d. per 100 in tins of 25, f.o.r. Salisbury. A quantity of larger sized trees, four in a tin, will also be available at 1s. per tin. In some cases the supplies are limited.



Aloe bulbels and seed of *Dalbergia sissoo* can also be supplied.

Applications, together with cheque or money order, should be addressed to the Government Agriculturist and Botanist, Department of Agriculture, Salisbury.

|                              |                      |
|------------------------------|----------------------|
| <i>Albizzia lebbek</i>       |                      |
| <i>Casuarina leptoclada</i>  | = Beefwood           |
| <i>Cedrela toona</i>         | = Indian toona       |
| <i>Callitris calcarata</i>   | = Cypress pine       |
| " <i>robusta</i>             | = Murray pine        |
| <i>Cupressus arizonica</i>   | = Arizona cypress    |
| " <i>lusitanica</i>          | = Portuguese cypress |
| " <i>sempervirens</i>        | = Common cypress     |
| " <i>torulosa</i>            | = Himalayan cypress  |
| <i>Dalbergia sissoo</i>      |                      |
| <i>Eucalyptus amygdalina</i> | = Peppermint gum     |
| " <i>calophylla</i>          |                      |
| " <i>citriodora</i>          | = Lemon-scented gum  |
| " <i>longifolia</i>          |                      |
| " <i>paniculata</i>          | = Iron bark gum      |
| " <i>robusta</i>             | = Swamp mahogany     |
| " <i>rostrata</i>            | = Rostrata gum       |
| " <i>saligna</i>             | = Saligna gum        |
| " <i>tereticornis</i>        | = Red gum            |
| <i>Jacaranda mimosæfolia</i> | = Jacaranda          |
| <i>Pinus densiflora</i>      |                      |
| " <i>halepensis</i>          | = Aleppo pine        |
| " <i>longifolia</i>          | = Cheer pine         |
| <i>Thuja orientalis</i>      | = Arbor vitæ         |
| " <i>gigantea</i>            |                      |

### Tobacco Seed

Tobacco planters are reminded that orders for seed should be forwarded to the Manager of the Warehouse, Salisbury, on or before the 15th August.

### CITRUS CULTIVATION.

THE services of Mr. C. E. Farmer, Adviser on Citrus Cultivation to the British South Africa Company, are available. The British South Africa Company will be pleased to receive applications from farmers desirous of obtaining advice from Mr. C. E. Farmer on citrus cultivation, and to place his services at the disposal of the farming community, in so far as his duties permit. Applications, which will be dealt with in order of date, should be addressed to the Director of Land Settlement, Salisbury. No fee will be charged for Mr. Farmer's services.

## Departmental Bulletins

The following Bulletins, consisting of reprints of articles which have appeared in this Journal, are available for distribution free of charge to applicants in Rhodesia :—

### AGRICULTURE.

- No. 2. The Possibilities of Rhodesia as a Citrus Growing Country, by R. McIlwaine, M.A., LL.B.
- No. 61. Requirements in sending Botanical Specimens to the Department for Identification.
- No. 71. Report of Forestry in Southern Rhodesia, by J. Sims, F.H.A.S.
- No. 79. Winter Cereals, by H. Godfrey Mundy, F.L.S.
- No. 81. Possibilities of Export Trade in Oil Seeds, by H. Godfrey Mundy, F.L.S.
- No. 97. Hints on Irrigation (Pipes and Pipe-laying), by W. Martin Watt, Agricultural Engineer.
- No. 125. Subterranean Water, by W. M. Watt.
- No. 137. Drainage for Irrigated and Swampy Land, by W. M. Watt.
- No. 156. Elephant Grass or Napier's Fodder, by J. A. T. Walters, B.A.

### CROPS.

- No. 88. Chicory Growing, by H. Godfrey Mundy, F.L.S.
- No. 93. Soy Beans, by R. H. B. Dickson.
- No. 106. Cultivation and Preparation of Ginger.
- No. 107. The Cowpea, by R. H. B. Dickson.
- No. 126. Turkish Tobacco.
- No. 128. Paspalum, by J. A. T. Walters, B.A., Assistant Agriculturist and Botanist.
- No. 132. Sumatra Tobacco, Hints to Rhodesian Growers, by C. J. Sketchley.
- No. 133. Tobacco Culture (Virginia)—Planting, Cultivation, Fertilising, Priming, Topping, Suckering, Ripening.
- No. 136. Ensilage, by H. G. Mundy, F.L.S.
- No. 138. Tobacco Culture (Virginia)—Harvesting and Curing.

### ENTOMOLOGY AND VEGETABLE PATHOLOGY.

- No. 12. The Tsetse Fly, by Ll. E. W. Bevan, M.R.C.V.S.
- No. 46. The Head Smut of Maize, by H. Godfrey Mundy, F.L.S.
- No. 58. Onion Thrips, by R. W. Jack, F.E.S.
- No. 66. Selection of Spraying Outfit, by R. W. Jack, F.E.S.
- No. 69. Resin Wash and Means of Applying It, by R. W. Jack, F.E.S.
- No. 75. Fumigation of Fruit Trees with Hydrocyanic Acid Gas, by R. W. Jack, F.E.S.

- No. 89. Insect Friends of the Farmer, by R. W. Jack, F.E.S.  
 No. 100. Tsetse—Preliminary Notes on the Habits of—by R. W. Jack, F.E.S.  
 No. 120. Some Insect Pests of Maize, by R. W. Jack, F.E.S.  
 No. 140. Insect Pests of Tobacco in Southern Rhodesia, by R. W. Jack, F.E.S.  
 No. 142. The Bean Stem Maggot, by R. W. Jack, F.E.S.  
 No. 147. Root Gallworn, by R. W. Jack, F.E.S.  
 No. 148. Darkling Beetle Grubs Injurious to Tobacco, by R. W. Jack, F.E.S.  
 No. 151. Potato Spraying Experiments for the Control of Early Blight, by Rupert W. Jack, F.E.S.  
 No. 154. Borers in Native Timber—Results of Experiments with Preservatives, by Rupert W. Jack, F.E.S.

## VETERINARY.

- No. 50. Epizootic Abortion in Cattle, by Ll. E. W. Bevan, M.R.C.V.S.  
 No. 51. Strangles, by F. D. Ferguson, M.R.C.V.S.  
 No. 53. Animals Diseases Consolidation Ordinance, 1904.  
 No. 54. African Coast Fever, by Ll. E. W. Bevan, M.R.C.V.S. (revised edition).  
 No. 80. Detection and Prevention of Diseases of Stock, by Ll. E. W. Bevan, M.R.C.V.S.  
 No. 84. African Coast Fever—Diagnosis of Gland Puncture, by Ll. E. W. Bevan, M.R.C.V.S.  
 No. 91. Common Ailments of the Horse, by D. R. Chatterley, M.R.C.V.S.  
 No. 95. Oestrus-ovis in Sheep, by Alec King.  
 No. 103. Dipping and Tick-Destroying Agents, by Lt.-Col. H. Watkins-Pitchford.  
 No. 114. Anaplasmosis of Sheep, by Ll. E. W. Bevan, M.R.C.V.S.  
 No. 117. Ephemeral Fever or Three Days' Sickness in Cattle, by Ll. E. W. Bevan, M.R.C.V.S.  
 No. 121. Rabies, by Ll. E. W. Bevan, M.R.C.V.S., and T. G. Millington, M.R.C.V.S., D.V.H.  
 Conditions under which Government Veterinary Surgeons' Services are available to the public.

## MISCELLANEOUS.

- No. 10. Watering and Feeding of Live Stock on Railway.  
 No. 62. Services of Agricultural Engineer.  
 No. 77. Animals Diseases Amending Ordinance, 1911.  
 No. 83. Hints on Brickmaking, by G. T. Dyke.  
 No. 90. Reports on Experiments—Experimental Station, Salisbury, 1910-1911, by J. H. Hampton.  
 No. 93. Formation of Agricultural Credit Associations in Rhodesia, by Loudon M. Douglas, F.R.S.E.  
 No. 96. Swine Breeds and Breeding of, by Loudon M. Douglas, F.R.S.E.



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- No. 98. Pig Breeding and Feeding, by T. M. Rixon.
- No. 104. Stock Raising, by Otto Zimmerman.
- No. 105. Bacon Curing on the Farm, by Loudon M. Douglas, F.R.S.E.
- No. 108. Lime Deposits in Rhodesia and their Value, by G. N. Blackshaw, B.Sc., F.C.S.
- No. 110. Utility Poultry Keeping, for Amateurs and Beginners, by "Gallinule."
- No. 119. Some Notes on Charcoal Burning, by Eric A. Nobbs, Ph.D., B.Sc.
- No. 123. Feeding and Care of Imported Bulls, by R. C. Simmons.
- No. 124. The Manuring of Maize on the Government Experiment Farm, Gwebi, 1912.
- No. 127. Notes on the Building of Farm Homesteads, by R. C. Simmons.
- No. 129. How to Make Use of the "Fencing Ordinance, 1904," by N. H. Chataway.
- No. 134. Plans and Specifications for Flue Curing Tobacco Barns.
- No. 141. Dry Season and Droughts in Rhodesia, by Rev. E. Goetz, S.J.
- No. 143. Hints on Planting an Orange or Lemon Grove, by Chas. E. Farmer, Citrus Adviser to the British South Africa Company.
- No. 144. Rhodesian Tobacco—Prospects of an Australian Market, by Eric A. Nobbs, Ph.D., B.Sc.
- No. 145. Prospects for Importation of Cattle from Australia, by Eric A. Nobbs, Ph.D., B.Sc.
- No. 146. Notes on Cattle Breeding, Part II., by R. C. Simmons.
- No. 149. Dry Season and Droughts in Rhodesia (continued), by Rev. E. Goetz, S.J.
- No. 150. Dry Season and Droughts in Rhodesia, by the Rev. E. Goetz, S.J.
- No. 152. A School of Agriculture for Southern Rhodesia, by Eric A. Nobbs, Ph.D., B.Sc., Director of Agriculture.
- No. 153. Citrus Fruit Trees—From Seed to Grove.
- No. 155. The Manuring of Maize on the Government Experimental Farm, Gwebi, 1912-13.
- No. —. Orange and Lemon Growing in Southern Rhodesia, by R. McIlwaine.
- Health and Clothing.
- Malaria: its History, Prevention and Cure, by A. M. Fleming, C.M.G., M.B., F.R.C.S. (Ed.), D.P.H. (Camb.), Medical Director.
- Game Law: Summary of.
- Terms for Analysis by the Department of Agriculture, of Produce, Soils, Water, etc.
- Tree Culture in Southern Rhodesia, by P. B. S. Wrey, A.M.I.C.E.
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**HANDBOOK OF TOBACCO CULTURE** for  
**Planters in Southern Rhodesia.** Sold by the Depart-  
 ment of Agriculture. 2/6.

## Employment on Farms.

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The Department of Agriculture receives numerous enquiries from persons of varied attainments, age and financial position for openings on farms, as managers, assistants and learners, requiring remuneration on corresponding scales, or willing to give services in return for keep.

In order that work may be found for the above and needs of farmers met, applications are invited from both employers and persons seeking employment. Applications are also invited from artisans, such as masons, bricklayers, carpenters, fencers, well sinkers, concrete workers, and the like who may desire work on farms. In cases where employers have obtained the labour they require, or applicants for employment have found work, it is requested that notification be at once sent to the Department of Agriculture, in order that unnecessary correspondence be avoided.

Replies to the following applications should be addressed to the initials of the advertisers, c/o Director of Agriculture, who will forward the letter to the party referred to.

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### SITUATIONS VACANT.

C. E., P.O., Umvuma.—Wanted clerk to keep farm books and accounts and assist generally; some knowledge of native language required. Salary to start with, £10 per month and room.

W. L. E.—Man to take charge of orchard; 1,000 trees on farm of 1,800 morgen; labour and quarters supplied; share in profits.

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### SITUATIONS WANTED.

G. A. M.—Nine years' experience at farming in Rhodesia. Thorough knowledge of buildings, tanks, etc.; would like management of a stud farm.

M. A. M.—English and Canadian experience of general farming and stock. Prepared to manage an estate or dairy farm. Understands culture and curing of tobacco. Prefers to go in on share principle, but with small salary.

B. M.—As manager of tobacco farm.

B. O. M.—As manager of tobacco farm.

G. N.—Thorough experience in bacon curing, etc.

E. A.—As farm manager; married; experienced in fruit, cattle and general farming. Experience 20 years in California, Ceylon, Transvaal and Rhodesia. Excellent references.

C. A.—Age 18. Employment on farm to gain experience. Two years dairying and fruit farming in Cape Province.

R. D. B.—As assistant on farm. Five years' general experience. Will work six months on trial at £5 per month, board and lodging.

J. W. D.—Assistant on farm. General experience.

M. H. M.—Lady, experienced in poultry and dairying, desires position on shares or other terms.

F. W. T.—Four years' experience in tobacco growing, wants position as manager or on shares. First-class references.

H. G.—Age 30; married; nine years' experience in German West Africa, two years' in Rhodesia; general and dairy farming.

W. B. M.—As farm assistant; experience of dairying and fruit growing.

A. K. H.—As farm manager or assistant; three years' Rhodesian experience; cattle, dairy, general farming, and tobacco (air and flue curing). Thorough knowledge of machinery, tractors, etc., and repairs. Moderate salary and share.

A. V.—As manager or assistant; thorough knowledge of mixed farming, cattle, and fruit growing.

C. A. F.—Employment wanted by man, aged 40, with knowledge of tobacco, cotton and citrus growing, also general farming; references; salary required with percentage of crop.

W. T. S.—Farm assistant; knowledge of general farming.

G. W. D.—As manager or assistant on dairy farm; five years' experience; holding diplomas in dairying. Could invest some capital in suitable farm.

J. F. T.—Farm assistant; general farming and tobacco; moderate salary.

J. W. H.—Farm manager or assistant; general farming and tobacco; salary and share.

A. P.—Experienced market gardener and farmer requires management of farm, with irrigation preferred; share of profits or small salary with share.



## Government Notices.

### ANIMALS DISEASES AMENDING ORDINANCE, 1911.

Ordinance No. 2, 1911.]

[Promulgated 17th March, 1911.

BE IT ENACTED by the Administrator of Southern Rhodesia, with the advice and consent of the Legislative Council thereof, as follows :—

1. So much of the "Animals Diseases Consolidation Ordinance, 1904" (hereinafter referred to as the said Ordinance) and of any other law as may be repugnant to or inconsistent with the provisions of this Ordinance is hereby repealed.

2. The Administrator may, on the outbreak of a destructive disease, or when there is suspicion of the existence of such disease, declare an area around and including the place where such disease exists, or is supposed to exist, actively infected for the purpose of this Ordinance.

3. Whenever an area shall have been declared infected in terms of the last preceding section, the Administrator may, for the purpose of suppressing or controlling disease, cause such fences to be erected along the boundaries of or across any farms or land situated in such area as he may deem necessary.

4. (1) If the landowner shall not pay the cost of erecting any fence as aforesaid upon completion thereof, the cost shall be defrayed in the first instance out of moneys provided by the Legislative Council.

(2) When any fence erected as aforesaid runs along the boundary of a farm, the cost of the erection of such fence shall, if not sooner repaid, be repaid, together with interest at the rate of £5 per centum per annum, by equal yearly instalments commencing two years after the fencing is completed, such instalments being so calculated and fixed that the said cost and interest shall be wholly repaid within a period of fifteen years from the date when the first instalment became due.

(3) Such repayment shall be made by the adjoining landowners whose land has been divided by the fence. Each such landowner shall pay one-half the cost of the dividing fence and interest as aforesaid. When the adjoining land is a native reserve, or a portion of such reserve, the one-half of the cost shall be paid from funds in the local Treasury of the British South Africa Company.

(4) When any fence as aforesaid shall be erected within, and not on and along, the boundaries of any farm, the cost shall be paid from the funds of the local Treasury of the British South Africa Company, and the fence when no longer necessary for the purpose for which it was erected may be removed by the British South Africa Company; provided that the landowner shall have the right to purchase such internal fence at a price representing the total cost of such fence.

(5) The term "owner" shall mean (a) the person registered as such in the office of the Registrar of Deeds, (b) the British South Africa Company in respect of native reserves, and (c) the local authority in respect of municipalities.

5. Where the bed of a stream or river lies immediately between or constitutes the boundaries of land owned by private owners, the fence may be erected on one or other bank of the river or stream and across it, or partly

on one bank, across it, and partly on the other bank, in such manner as may be agreed upon by the owners whose lands are separated by the said stream or river. The Administrator may call upon the said owners to agree to the position of the said fence on or before a date fixed by him, and, should they fail to do so, he may cause such fence to be erected without further reference to the said owners. For the purposes of repayment, such fence shall be considered as dividing the lands of adjoining owners, and half the cost shall be recoverable from each owner whose lands are separated by the said stream or river.

6. The Administrator may call upon any owner whose land has been fenced in terms of section 3 or 12 to provide sufficient security for the payment of any sums that may be due to the British South Africa Company in its local Treasury in respect of such fence. If the owner shall fail or refuse to provide such security, the Administrator may cause a notice in writing to be sent to the Registrar of Deeds of the amount due by such owner, and the Registrar shall make an entry thereof in respect of the land fenced. Such entry shall constitute an hypothecation of the land, ranking from the date on which the entry was made and for the amount therein stated; provided that the Registrar may pass transfer of land so hypothecated if the transferee agrees in writing that any sums due and unpaid shall remain and be registered as a charge against the said land.

7. When any land held under lease or permit of occupation has been fenced in terms of this Ordinance, during the term of such lease or permit the lessee or permit holder shall pay to the proprietor of such land yearly, during the continuance of the lease or permit of occupation, interest at the rate of £5 per centum upon so much of the cost of the fence as the proprietor is liable for, and such payment shall be made with the rent of the land, and shall be deemed in law to be part of such rent.

8. Any tenant or holder of land under a permit of occupation having a right to purchase such land at a fixed price shall, on completion of the purchase, pay to the proprietor, in augmentation and as part of the purchase money, any sum paid by such proprietor for the fencing of such land, and shall become and be liable to repay to the British South Africa Company in its local Treasury such sums as remain unpaid, as the same become due and payable in terms of this Ordinance.

9. Where in the case of any local authority the title to land provides that upon the sale thereof the British South Africa Company shall be entitled to receive a proportion of the purchase price, the local authority shall be entitled to deduct from the purchase price of land sold any debt due or amount paid by it in respect of fences on the land so sold erected under this Ordinance.

10. The provisions of sections 14 and 15 of the "Fencing Ordinance, 1904," in regard to repairs shall, *mutatis mutandis*, apply to fences erected in terms of this Ordinance.

11. Where a fence crosses any road used as of right by the public or by any neighbouring landowner, a properly constructed swing gate shall be placed at the point of crossing.

12. Any person opening such gate, except for the purpose of passing through, or omitting to close such gate after having passed through, and any person damaging such gate and omitting to immediately repair such damage shall be liable to a fine not exceeding £10, or in default of payment to imprisonment with or without hard labour for a period not exceeding one month.

13. The Administrator may, for the purpose of the more effective prevention or control of disease, apply the provisions of this Ordinance in respect of fencing to municipalities and townships and such land adjoining as may be deemed expedient, and to places within a radius of ten miles of an area declared actively infected in terms of section 2 hereof, if, owing to the number of cattle in such places, or other causes, it appears expedient.

14. (1) The owner or proprietor of the land along the boundaries of which fences have already been erected by the British South Africa Company for the purpose of preventing the spread of



African Coast Fever in cattle shall be and is liable to repay to the British South Africa Company in its local Treasury one-half of the cost of so much of the fence as may be along the boundary of such land. The provisions of sections 7 and 8 of this Ordinance shall apply in the case of land held under lease or permit of occupation along the boundaries of which fences have already been erected. The British South Africa Company may remove any such fence already erected which is within and not on or along the boundaries of any land when no longer necessary for the purposes for which it was erected.

- (2) Any payment due in respect of any such fence may be made as provided by section 4 of this Ordinance, and under the like conditions as to security for such payment as are prescribed under section 6.

15. Within any area declared by the Administrator to be actively infected under the provisions of section 2, or to which the provisions of this Ordinance shall have been applied in terms of section 12, the Administrator may for the purpose of more effectively preventing the spread of disease cause to be constructed on any land a dipping tank and any structures incidental thereto or other appliances for the dipping of stock, and may recover the expenditure incurred from the owner of the land on which such tank, structures or appliances have been constructed. The cost of such tank, structures or appliances shall be paid on the same terms and under the same conditions as are applicable to boundary fences under sections 4, 6, 7 and 8 of this Ordinance.

16. In addition to any penalties that may be imposed under the said Ordinance or any amendment thereof, or under any regulations framed thereunder for the unlawful movement of cattle, the Court of the Magistrate before which the case is tried or the High Court in the like instance may direct the confiscation of any cattle unlawfully removed, and such cattle, if infected with disease or likely to convey infection, shall be destroyed without compensation. Should there be no danger of infection the Administrator may order such cattle to be temporarily kept at any spot denoted by him and then sold. The proceeds of any such sale shall be paid to the British South Africa Company in its local Treasury.

17. Section 11, sub-section (1) of the said Ordinance is hereby repealed, and in lieu thereof the following shall be the section:—

“Should any Inspector, Sub-Inspector or any person specially authorised by the Administrator to carry out the provisions of this Ordinance know or suspect that any animal is infected with any destructive disease such Inspector, Sub-Inspector or other authorised person may forthwith place such animal in quarantine, together with such land as is necessary for its isolation, and such animals as have been or are suspected of having been in contact with such animal or with infection. Notice of such quarantine shall be given in writing to the owner or custodian of such animal and to the Magistrate of the district, and shall remain in force for such time as the Chief Inspector or Controller of Stock may direct, unless the Administrator shall sooner, if he thinks fit, issue the notice referred to in sub-section (2) of section 5. A copy of the notice of any such quarantine shall be posted at the office of the Magistrate, and shall be inserted by the Magistrate in some newspaper, if any, circulating in the district.”

18. Section 16 of the said Ordinance is hereby repealed, and in lieu thereof the following shall be the section:—

“Any Government Veterinary Surgeon or any person thereto authorised by the Controller of Stock, Chief Inspector or by a Magistrate may enter any land, building, kraal or enclosure for the purpose of inspecting animals. Should any animal be found to be infected with any destructive disease, or should such infection be reasonably suspected, he may quarantine such animals as in this



Ordinance provided, and may order the proper disinfection of any building, kraal or enclosure in which such animal is or may recently have been, and the furniture and fittings thereof. Should it be impossible to properly disinfect such stable, kraal or enclosure, furniture or fittings in any of them, he may order the destruction thereof; provided that no building, kraal or enclosure shall be destroyed unless the owner consents thereto in writing, or failing such consent, the Administrator orders that such destruction be carried out."

19. Section 22, sub-section (1) of the said Ordinance is hereby amended by the addition of the following words after the word "obtained" in the twelfth line of the said sub-section, "and any person receiving or taking delivery of any animals without having ascertained that such permit has been obtained."

20. This Ordinance may be cited as the "Animals Diseases Amending Ordinance, 1911," and shall be read as one with the "Animals Diseases Consolidation Ordinance, 1904," and the "Animals Diseases Amendment Ordinance, 1910."

No. 216 of 1912.]

[4th July, 1912.

#### REMOVAL OF CATTLE TO PRESCRIBED AREAS.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare that, notwithstanding the provisions of Government Notices Nos. 47 and 254 of 1910 and 51 of 1911 the removal of cattle to any point within twenty miles of the border of the territory defined by the Crocodile, Shashi and Ramaquabane Rivers, to the south-east beacon of Mphoeng's extension on the last named, may be allowed until further notice under permit from the Chief Inspector for the purposes of grazing and watering.

No. 50 of 1912.]

[8th February, 1912.

#### AFRICAN COAST FEVER.

*Regulations regarding the movement of cattle and the prevention and suppression of disease.*

1. UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw Government Notices Nos. 329 of 1910 and 308 of 1911 and make the following provisions in lieu thereof:—

2. The various districts of Southern Rhodesia are hereby declared an area infected with African Coast Fever for the purposes of section 5 (2) of the aforesaid Ordinance, and, save as hereinafter set out, all movement of cattle within the said districts is prohibited until further notice.

#### *General Movement.*

3. For the purpose of section 22 (1) of the said Ordinance, the following shall be regarded as places within the boundaries of which the movement of cattle may be allowed without special permission:—

- (a) Single farm.
- (b) Two or more adjoining farms, farmed together under one management and situated within one cattle transport area.
- (c) An area, the property of one owner, enclosed by a substantial fence.
- (d) For grazing purposes, an area within a radius of four miles of native kraals situated on unalienated land or in reserves, save and in so far as such area includes any private land.

The sites of such kraals shall be deemed to be the places where they are situated at the date of promulgation of these regulations.

4. Notwithstanding the provisions of the last preceding section, or of section 9 hereof, the Chief Inspector may, on the outbreak of disease, or for such other cause as may be deemed expedient, direct the isolation or quarantine of cattle on a limited area of the aforesaid places.

5. The movement of cattle from place to place may be permitted under the special permission, in writing, of an Inspector, Sub-Inspector, or other officer or person duly authorised by the Administrator to grant such permission.

6. No permission as aforesaid shall permit the movement of cattle—

- (a) Without the written consent of the owners, occupiers or managers of occupied land, and in the case of native reserves, of the Native Commissioner of the district over which land or reserve such cattle will pass, whether along roads or otherwise; provided, however, that refusal to grant such consent shall be in writing, and provided further that if the Controller of Stock or the Chief Inspector shall consider that such consent is withheld without good and sufficient cause he may permit of movement without such consent.

If any such person mentioned above refuse to give consent or to state a reason for refusing to do so in writing, no valid objection shall be deemed to exist and movement may be permitted without such written consent.

- (b) Within a veterinary district as defined in the Schedule annexed hereto from one transport area to or through another without the consent of the Cattle Inspector in charge of such area.
- (c) From any veterinary district to or through another without the consent of the District Veterinary Surgeon of such district.

#### *Slaughter Cattle.*

7. Cattle moved to any centre for slaughter under the provisions of these or any other regulations shall, on arrival, be immediately taken to such quarantine area (if any) as is provided for the purpose and immediately branded with the letters "V.D." on the near hip.

8. Cattle admitted to a quarantine area in terms of the last preceding section shall be slaughtered within twenty-one days of the date of admission, and shall not be permitted to leave the same except for the purpose of being slaughtered at the appointed abattoir, and if found outside such area, except for the said purpose, may be destroyed on the order of the Chief Inspector or Controller of Stock; provided, however, that the Chief Inspector may allow the removal of cattle from such an area under such conditions as he may prescribe.

#### *Transport Cattle.*

9. The use of cattle for draught purposes is prohibited except:—

- (1) Within the boundaries of the places defined in section 3 (a), (b) and (c) hereof.
- (2) Within the boundaries of areas already fixed for the use of cattle for draught purposes in terms of regulations published under Government Notice No. 329 of 1910, or such other areas as may be fixed by the Administrator.

10. Notwithstanding the provisions of section 9, no permit shall authorise the working of cattle

- (a) which are not clearly and distinctly branded with the registered brand of the owner;
- (b) in any wagon or vehicle which shall not have the owner's name and address legibly and permanently inscribed on the right side thereof.



11. No wagon or other vehicle drawn by oxen shall be moved from one cattle transport area into another without the permission of the Cattle Inspectors concerned, and under such conditions as they may impose.

*General Provisions.*

12. On the outbreak or suspected outbreak of disease, the Administrator may declare an area of infection around and embracing the place of outbreak or suspected outbreak, and a further area or areas around such area of infection as a guard area, whereupon all movement of cattle into and from place to place within such area or areas shall be immediately suspended, except as hereinafter provided.

*A.—In areas of infection and guard areas:—*

- (1) Cattle in transit by rail may be moved through such area.
- (2) Cattle from beyond the borders of Southern Rhodesia may be detained within such area or areas *en route* to destination.
- (3) Cattle for *bona fide* farming, dairy and slaughter purposes may be moved into such area or areas by permission of the Chief Inspector and under such conditions as he may impose.

*B.—In guard areas only:—*

Cattle may be moved into and from place to place within such area under the conditions of section 6 hereof.

13. The removal of green forage, hay, fodder, bedding reeds, manure or of such other articles as may be reasonably supposed capable of conveying infection, shall be prohibited from areas of infection, save and except with the special permission of the Administrator.

14. Whenever an area shall have been declared under section 12 hereof, every person within such area, or within such further area as may be specified by Government Notice, owning or in charge of cattle shall, upon the death or slaughter because of disease, suspected disease, or accident, of any such cattle, immediately report such occurrence through the nearest Cattle Inspector, Native Commissioner or Police Officer to the District Veterinary Surgeon.

15. Notwithstanding the provisions of these regulations, it shall be competent for the Chief Inspector of Cattle to authorise and direct the movement of cattle for the purposes of isolating, dipping, quarantine, or any other such objects as may be deemed necessary to prevent or suppress an outbreak of disease.

16. Whenever an area shall have been declared an area of infection or guard area in terms of section 12 hereof, any person who shall allow any cattle to stray or be otherwise removed, except as provided for in these regulations, from any one place within such area to another place, or from a place outside of to a place within such area, shall be guilty of an offence against these regulations.

17. All cattle within the limits of the various commonages and townlands, areas of infection and guard areas as declared under section 12 hereof, or depastured on common grazing ground, shall be dipped or sprayed at least once in every three days, unless the Chief Inspector shall authorise the extension of the time between such dipping or spraying, or the entire suspension of the same.

18. In all areas of infection and guard areas sheep and goats shall be dipped at such periods as may be directed by the Chief Inspector.

19. Whenever the owner, occupier, or manager of a farm shall adopt means of cleansing cattle running thereon, either by spraying, dipping, or by any other method, the Chief Inspector may order any natives or other persons having cattle on the same farm to cleanse such cattle, and the Native Commissioner of the district within which the farm is situated may enter into an arrangement with the native owners of cattle to cleanse such cattle at a charge to be mutually agreed upon between the said owner, occupier or manager and the said native owners.



20. All permits for the removal of cattle issued under the provisions of the said Ordinance or of any regulations framed thereunder shall specify legibly and clearly on the face thereof the place from and to which such cattle may be removed, the route by which they shall travel, the number and brands of such cattle, the time allowed for the journey, and such other particulars and conditions as it may be deemed expedient to provide.

21. No permit issued for the movement of cattle shall be taken to authorise any trespass in connection with such movement.

22. Notwithstanding the provisions of these regulations, it shall not be lawful for any owner of cattle to allow any such cattle to be on any road, public outspan, commonage, or any property other than that of the owner, unless they are free from ticks or unless they have been effectively cleansed by dipping, spraying or other process, within fourteen days of being allowed on such road or other place. Any beast having ten or more ticks on it shall not be considered free from ticks.

23. Any person contravening the provisions of these regulations or the conditions set out in permits issued thereunder, shall, where no higher penalty has been by the said Ordinance or any other law provided, be liable in respect of each offence to a fine not exceeding £20, or in default of payment to imprisonment with or without hard labour for a period not exceeding three months.

### SCHEDULE "A."

#### VETERINARY DISTRICTS OF SOUTHERN RHODESIA.

##### (1) *Salisbury.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912 :—

32. Battlefields; 33. Hartley and Gatooma; 34. Gadzema Station; 35. Makwiro Station; 36. Norton Siding; 37. Hunyani Tank; 38. 1645½ Peg B. & M. & R. Railways; 39. Salisbury A.; 40. Salisbury B.; 41. Salisbury C.; 42. Salisbury D.; 43. Arcturus; 44. Bromley; 45. Marandellas North; 46. Marandellas South; 48. Headlands Station; 49. Junction Mazoe and Lomagundi Railways; 50. 23-Mile Peg, Lomagundi Railway; 51. Passaford Station; 52. 35-Mile Peg, Lomagundi Railway; 53. Gwibi Tank Halt; 54. Banket, Lomagundi; 55. Eldorado, Lomagundi; 56. Selby Siding; 57. Mazoe; and 58. Kimberley Reefs.

##### (2) *Bulawayo.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912 :—

1. Plumtree; 2. Marula Siding; 3. Figtree; 4. Westacre Junction; 5. Bulawayo Area; 6. Heaney Junction; 7. Bembesi Station; 8. Insiza North; 9. Insiza South; 10. Shangani North; 11. Shangani South; 14. Redbank; 15. Nyamandhlovu Station; 16. Malindi Station; 17. Wankies Area; 18. Matetsi Siding; 19. Matopo Terminus; 20. Sabiwa Siding; 21. Gwanda Station; 22. West Nicholson; 23. Belingwe; 59. Essexvale and Balla Balla Areas; 60. Stanmore Siding Area; 61. Filabusi Area.

##### (3) *Gwelo.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912 :—

12. Somabula Siding; 13. Gwelo Station; 24. Selukwe Area; 25. Surprise Area; 26. Indiva Siding; 27. Lalapanzi; 28. Iron Mine Hill Siding; 29. Umvuma Siding; 31. Que Que Station.

##### (4) *Umtali.*

An area comprising the native districts of Umtali, Melsetter, Makoni and Inyanga.

No. 189 of 1912.]

[6th June, 1912.]

## REMOVAL OF CATTLE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare that, notwithstanding the provisions of section 12 of Government Notice No. 50 of 1912, the removal of cattle for purpose of obtaining food or water may be permitted at the discretion of the Chief Inspector, and under such conditions as he may prescribe.

No. 175 of 1912.]

[30th May, 1912.]

## AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that, notwithstanding the provisions of Government Notices Nos. 47 and 254 of 1910 (and 51 of 1911), the removal of cattle to within that portion of the prescribed areas westward of the Salt River, Tuli district, may be allowed under permit from the Chief Inspector, for the purposes of grazing and watering.

No. 233 of 1912.]

[11th July, 1912.]

## AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw Government Notice No. 127 of 1910, in so far as it relates to the Protectorate of Nyasaland, and further do hereby prohibit the introduction into Southern Rhodesia of cattle from Nyasaland until further notice.

No. 82 of 1913.]

(As Amended.)

[13th March, 1913.]

## AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Government Notices Nos. 338 of 1912 and 13 of 1913, and, in terms of section 12 of Government Notice No. 50 of 1912, declare the following areas of infection and guard areas for the purposes of the said Ordinance:—

- (1) THE NATIVE DISTRICTS OF BULAWAYO, MATOBO, BULALIMA-MANGWE AND BUBI.

*Area of Infection.*

The farms Collaton, Irene, Mabogutwaneni Outspan, and within a radius of four miles of Inyamba's Kraal on Alnwick Estate.

*Guard Areas.*

(a) An area bounded by and including the following farms:—Alnwick Estate, Joe's Luck, Honeybird Kop, Doublevale, Maritzburg, Springvale, Outspan No. 3 Tati Road, Vregevecht, La Concorde, Lucydale, Lonsdale, and the fenced north-western section of Westacre Creek.

(b) The fenced sub-division of Bulawayo Commonage which includes the township, suburbs and Hillside.

(c) The farm Induba.

## (2) NATIVE DISTRICT OF SALISBURY.

(a) *Areas of Infection.*

- (1) Hatfield Estate and Hatfield Estate plots;
- (2) Salisbury commonage;
- (3) the southern portion of the farm The Grange.

(b) *Guard Area.*

An area bounded by and including the following farms :—Zizalisari Outspan, Thorn Park, Komani, Good Hope, Hayden, Stamford, Gillingham, Park Ridge, Willowvale, Hopley, Saturday Retreat, Odar Outspan, Stoneridge, Eyrecourt, Boutelle, Twentydals, Deanesbrook, Galway Estate, Sebastapool, Caledonia, Father Hartmann's, Chishawasha, Glen Lorne, Borrowdale Estate and Teviotdale.

## (3) NATIVE DISTRICT OF UMTALI.

(a) *Area of Infection.*

Umtali Commonage.

(b) *Guard Area.*

The farms Devonshire, Quagga's Hoek, Fern Valley and Fern Hill.

No. 123 of 1913.]

[24th April, 1913.]

## AFRICAN COAST FEVER.

WHEREAS there has been an outbreak of a destructive disease, to wit, African Coast Fever, on the Hatfield Estate Plots, I, under and by virtue of the powers vested in me by the "Animals Diseases Amending Ordinance, 1911," do hereby declare the following area in the native district of Salisbury to be an area actively infected with African Coast Fever for the purposes of the said Ordinance :—

An area bounded by and including the following farms :—Makabusi Outspan, Hopley, Saturday Retreat, Odar Outspan, Stoneridge, Eyrecourt, Boutelle, Twentydals, Glenwood, Adelaide, Ventersburg, Makabusi, Gallagher's, M.T.C., Hatfield Estate, Hatfield Estate Plots, Prospect and Ardennie Township.

No. 143 of 1913.]

[15th May, 1913.]

## AFRICAN COAST FEVER.

I DO hereby, in terms of section 12 of the regulations published under Government Notice No. 50 of 1912, declare the following area of infection and guard area for the purposes of the said regulations :—

(a) *Area of Infection.*

The farms Inodzi, Nyagari, Mountain Home (The B.), Umtali Mission and the Penhalonga Valley.

(b) *Guard Area.*

That portion of the native district of Umtali bounded on the south by a line running from the Odzi River along the south-western boundaries of the farms Odzi Junction, Grange, and Premier Estate, and the northern boundaries of the farms Devonshire, Wiermouth and Umtali Commonage to the Anglo-Portuguese boundary.



No. 145 of 1913.]

[15th May, 1913.]

FEES FOR DIPPING CATTLE AT GOVERNMENT DIPPING  
TANKS.

UNDER and by virtue of the powers vested in me by section 5, subsection 6 (e), of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare that a charge of one penny per head will be made in respect of all cattle dipped at Government dipping tanks. Unweaned calves will be dipped free of charge.

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No. 342 of 1912.]

[24th October, 1912.]

## TRANSPORT AREAS.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby, in terms of section 9 of the Regulations published under Government Notice No. 50 of 1912, declare that, until further notice, the main road between the Tokwe and Ngesi Rivers is included in Area No. 24, Government Notice No. 11 of 1912, and the use of cattle for draught purposes is therefore permitted up to the Ngesi River upon the said road.

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No. 392 of 1912.]

[19th December, 1912.]

## TRANSPORT AREAS.

WHEREAS it is desirable to afford facilities for a limited amount of transport with cattle from Shangani Station to the Native Commissioner's Office in the Belingwe district, I, under and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," do hereby, notwithstanding any regulations to the contrary, authorise the Chief Inspector to permit of such transport under such terms and conditions in writing as to him may seem fit.

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No. 22 of 1913.]

[16th January, 1913.]

## MOVEMENT OF CATTLE.

IT is hereby notified for general information that, in terms of section 5 of the regulations published under Government Notice No. 50 of 1912, I do hereby authorise Native Commissioners and Assistant Native Commissioners to issue permits for the movement of cattle from place to place, in conformity with the provisions of the said regulations.

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No. 110 of 1908.]

[16th April, 1908.]

## IMPORTATION OF CATTLE.

UNDER and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal so much of the Regulations published under Government Notice No. 187, dated the 26th of July, 1906, as relate to the importation of cattle from the Colony of the Cape of Good Hope and the United Kingdom of Great Britain and Ireland, and make the following provisions in lieu thereof:—

1. The importation of cattle may be permitted from the Colony of the Cape of Good Hope and the Orange River Colony on the following terms and conditions—

- (1) A permit shall be required from the Chief Inspector which may contain such conditions as shall from time to time appear expedient.
  - (2) Applications for permission to import shall be in the Form "A" attached hereto, and accompanied by a declaration in the annexed Form "B"
  - (3) The importation of cattle with more than two permanent central incisor teeth shall not be permitted.
  - (4) All importations shall be by rail and for the purposes thereof Bulawayo shall be regarded as the port of entry.
  - (5) All cattle imported in terms of these Regulations shall on arrival at Bulawayo, Salisbury, or Umtali be removed to a place of quarantine under the supervision of an Inspector of Cattle, there to be submitted to such examination and tests as the Chief Inspector may direct. If such examination or tests disclose the existence of any destructive disease the cattle shall be immediately destroyed and the carcasses thereof disposed of in such manner as a Government Veterinary Surgeon may authorise or require. The Chief Inspector may permit of any examination or tests as aforesaid being dispensed with in the case of cattle in transit by rail for any place beyond the boundaries of Southern Rhodesia.
  - (6) All expenses or losses incident to quarantine, examination, testing or destruction as aforesaid shall be borne by the owner of the cattle.
2. The importation of cattle from the United Kingdom of Great Britain and Ireland may be permitted under the following terms and conditions—
- (1) Importation shall be through and direct from the coast ports of the Cape Colony, and there shall be a consignment note or other satisfactory evidence that cattle so imported have come direct from Great Britain or Ireland.
  - (2) The provisions of sub-sections (5) and (6) of section 1 hereof shall apply to importations in terms of this section.
3. No person shall import cattle in terms of these Regulations except for his own use, provided however that permission may be granted to import for others on the applicant disclosing the name of the person or persons for whom he proposes to act.
4. Any person introducing cattle in contravention of these Regulations, or failing to comply with any conditions attached to permits to import, or furnishing applications, declarations, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, testing, destruction or disposal of carcasses, shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties shall have been provided for such offences by the "Animals Diseases Consolidation Ordinance, 1904," provided however that the penalties imposed by these Regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

## ANNEXURE "A."

## APPLICATION FOR CATTLE IMPORTATION PERMIT.

1. Applicant's Name and Address.....
2. Number and Class of Cattle to be imported.....
3. Area or Farm and District where Cattle are at present located.....  
.....
4. Area or Farm and District to which Cattle are to be moved.....  
.....

Applicant's Signature.....

Date.....

Application.....

Permit No.....

## ANNEXURE "B."

I, ..... residing on the farm  
..... in the district of ..... do  
solemnly and sincerely declare that the .....  
(number in writing) animals also enumerated below have been in my pos-  
session since birth, and that Lungsickness (Contagious Pleuro-Pneumonia)  
has not existed amongst any of my cattle, nor on my farm, during the last  
four years, and that no other bovine disease scheduled under the Diseases  
of Stock Act, 1911 (Union of South Africa) has existed amongst any of my  
cattle, nor on my farm, during the last twelve months, and that these  
animals have never been exposed for sale in any public market or stock  
fair.

Number of Animals ..... Bulls ..... Heifers .....

Breed .....

Seller's Name and Address .....

Purchaser's Name .....

Place in Southern Rhodesia to which animals are being sent  
.....

And I make this solemn declaration conscientiously believing the same  
to be true.

Declared to at ..... on this ..... day of.....

before me,

Resident Magistrate for the District of .....

No. 127 of 1910.]

[2nd June, 1910.]

IMPORTATION OF CATTLE FROM NORTH-EASTERN  
RHODESIA.

UNDER and by virtue of the powers vested in me by the "Animals  
Diseases Consolidation Ordinance, 1904," I do hereby declare and make  
known that the importation of cattle from North-Eastern Rhodesia may be  
permitted under the following terms and conditions:—



1. The permission of the Chief Inspector of Cattle be first had and obtained.

2. All cattle shall be introduced by way of the town or port of Feira, which is hereby declared a port of entry.

3. All applications for permission to import shall be accompanied by—

(1) A certificate by a Government Veterinary Surgeon of the territory of origin that—

a. the districts from which they come and through which they pass are free from contagious diseases of animals;

b. the animals in respect of which the application is being made have been examined and are free from any destructive disease.

4. All cattle shall on entry be taken to a quarantine area defined by the Chief Inspector of Cattle, and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, not less than three months.

5. Cattle at Feira at the date of promulgation of this notice may be removed to the quarantine area on permission of the Chief Inspector of Cattle without the certificates detailed above.

6. Any person found introducing cattle in contravention of these regulations, or failing to comply with any of the conditions attached to permits to import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties have been provided for such offence by the "Animals Diseases Consolidation Ordinance, 1904"; provided, however, that the penalties imposed by these regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

#### SCHEDULE "A."

##### 1. CERTIFICATE UNDER SECTION 3. (1), a.—

I hereby certify that I have examined the following cattle belonging to Mr. ....

..... Cows and heifers,

..... Calves,

..... Oxen and bulls,

and that the districts from which they come and through which they will pass in this territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signature .....

Government Veterinary Surgeon.

##### 2. CERTIFICATE UNDER SECTION 3. (1), b.—

I hereby certify that I have examined the following cattle belonging to Mr. ....

..... Cows and heifers.

..... Calves,

..... Oxen and bulls,

In my opinion these animals are free from all destructive diseases.

Signature .....

Government Veterinary Surgeon.

No. 60 of 1913.]

[13th February, 1913.

## IMPORTATION OF CATTLE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby authorise the importation from the Kingdom of the Netherlands of cattle required for *bona fide* breeding purposes; provided, however, that such importation shall *mutatis mutandis* be subject to the provisions of Government Notice No. 110 of the 16th April, 1908, relating to the importation of cattle from the United Kingdom of Great Britain and Ireland.

No. 47 of 1913.]

[6th February, 1913.

## IMPORTATION OF SHEEP, GOATS AND PIGS.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare that the introduction of sheep, goats and pigs against which no prohibition exists may be permitted from overseas, *via* the port of Beira, under the following conditions :—

- (1) Umtali shall be the port of entry;
- (2) that all such importations shall be in accordance with the regulations now in force or as amended from time to time;
- (3) that all animals shall be transferred directly after disembarkment to the railway trucks at Beira and conveyed thence to Umtali without leaving the said trucks.

## REGULATIONS UNDER WHICH STOCK IS ALLOWED TO PASS IN TRANSIT THROUGH THE TERRITORY OF THE MOZAMBIQUE COMPANY.

WITH reference to Government Notice No. 47 of 1913, the conditions under which stock is allowed to pass in transit through the territory of the Mozambique Company are published below for public information :—

(By "stock" is meant : horses, cattle, mules, donkeys, sheep, goats, pigs and dogs.)

I. The Customs official shall not allow disembarkation of any kind of stock at the port of Beira, when the said stock is in transit to Rhodesia, before a written permission from the Veterinary Department stating therein that disembarkation can take place.

II. In order to obtain this permit, mentioned in the foregoing article, the owner or his representative, who may be his Custom house broker, must have a written application for such permit, to the Chief Veterinary Surgeon of the Companhia de Mocambique, giving at the same time the following particulars, in writing :—

- (a) the number of heads of stock to be landed;
- (b) kind of stock;
- (c) what country the stock comes from, giving the name of the region;
- (d) the destination of such stock.

III. The importer, or his representative, must present at the same time the following certificates :—

- (a) one certificate from a Veterinary Surgeon of the country of origin of the said stock, stating that the region is free from any epizootic disease and that all the animals are also free from any such diseases;



- (b) a certificate signed by the captain of the ship which brought the stock, stating the number of deaths, if any, which have occurred during the voyage and if possible the cause of death.

IV. Having received the above-mentioned certificates and the information required by the foregoing articles, one of the Veterinary Surgeons of the Companhia de Mocambique, or their substitute, will proceed to inspect the stock on board the ship.

V. If during the inspection the Veterinary Inspector suspects the presence of any contagious disease, he will with the least possible delay investigate the case, and if his suspicions are confirmed and he has reason to believe that the disease in question might spread within the Territory of the Companhia de Mocambique, he shall refuse to issue the permit referred to in Article I. of this order.

VI. If after the inspection the Veterinary Surgeon or his substitute is satisfied that there is no danger in allowing such stock to pass through the Territory in transit, he shall issue the permit referred to in Article I. of this order.

VII. The Chief of the Customs Department, having received the permit referred to in Article I., shall allow disembarkation of the said stock under the following conditions :—

- (a) the only means by which any stock can be taken through the Territory is by rail;
- (b) that the stock should be taken directly after the disembarkation from the lighters to the railway station and placed in wagons or trucks. The windows and other openings for ventilation in the wagons should be covered up with wire netting, the meshes of which are small enough to prevent the entrance of biting flies, etc.;
- (c) having once been entrained, the animals will not be allowed to leave those wagons or trucks whilst they are in the Territory of the Companhia de Mocambique;
- (d) that any forage or hay that may be landed for the use of the stock to which this order refers, if not utilised for the purpose, will be burnt if between the time of disembarkation and the departure of the stock by train it has not been consumed, despatched or re-exported.

Any contravention of this order shall be considered a transgression, and as such be dealt with according to No. 3 of Article 74 of the Customs Regulations in force.

The authorities and every one whom it may concern to abide by and obey.

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No. 211 of 1910.]

[4th August, 1910.

#### IMPORTATION OF CATTLE FROM NORTH-WESTERN RHODESIA.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that, notwithstanding the prohibition contained in Government Notice No. 89 of 1908, the importation of cattle from North-Western Rhodesia may be permitted under the following terms and conditions :—

1. The permission of the Chief Inspector of Cattle shall be first had and obtained.



2. All cattle shall be introduced (a) by rail via the Victoria Falls, or (b) by way of the town or port of Feira, which are hereby declared to be ports of entry.

3. All applications for permission to import shall be accompanied by a certificate by a Government Veterinary Surgeon of North-Western Rhodesia that—

- (a) the districts from which they come and through which they pass are free from contagious diseases of animals;
- (b) the animals in respect of which the application is being made have been examined and are free from contagious diseases of animals.

4. All cattle shall on entry be taken, where possible by rail, to such quarantine area and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, but not less than three months.

5. Any person found introducing cattle in contravention of these regulations, or failing to comply with any of the conditions attached to permits to import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months; provided, however, that the penalties imposed by these regulations shall not exempt from liability to penalties, forfeiture, or destruction, elsewhere provided for

#### ANNEXURE "A."

##### *Certificates under Section 3.*

(a) I hereby certify that I have examined the following cattle belonging to Mr. ....

.....cows and heifers,  
 .....calves,  
 .....oxen and bulls,

and that the districts from which they come and through which they will pass in this Territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signed.....

Government Veterinary Surgeon.

(b) I hereby certify that I have examined the following animals belonging to Mr. ....

.....cows and heifers,  
 .....calves,  
 .....oxen and bulls.

In my opinion these animals are free from all destructive diseases.

Signed.....

Government Veterinary Surgeon.

NOTE.—All numbers are to be expressed in words.

### IMPORTATION OF STOCK FROM THE PROVINCE OF THE CAPE OF GOOD HOPE.

WITH reference to Departmental Notice of 28th February, 1912, it is hereby notified that the said Notice is cancelled, and importation of stock will now be permitted, in terms of Government Notice No. 110 of 1908, from the Province of the Cape of Good Hope, with the exception of the following districts :—

|                  |                               |
|------------------|-------------------------------|
| Komgha           | Stockenstroom                 |
| East London      | Queenstown (Gwatyu Ward only) |
| Peddie           | Glen Grey                     |
| Victoria East    | Maclear                       |
| Kingwilliamstown | Elliot Slang River            |
| Stutterheim      | Wodehouse                     |
| Cathcart         | Barkly East                   |

No. 375 of 1912.]

[28th November, 1912.

### IMPORTATION OF POULTRY.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," as amended by the "Animals Diseases Amendment Ordinance, 1910," I do hereby declare and make known that the following regulations shall be in force and effect from date of publication hereof :—

(1) All poultry imported by rail shall be inspected by an Inspector or Sub-Inspector at Plumtree, Bulawayo or Umtali.

(2) Should any consignment of poultry shew symptoms of disease, or should such Inspector or Sub-Inspector have reason to believe that any disease exists in, or that infection is likely to be conveyed by such consignment, he may order the detention and isolation of the whole consignment for such period as he may deem necessary.

(3) The Chief Inspector may order the destruction of all poultry which he has reasonable grounds for believing to be diseased or likely to convey infection.

No. 391 of 1908.]

[17th December, 1908.

### BRANDS ORDINANCE AMENDMENT ORDINANCE, 1908.

UNDER and by virtue of the powers vested in me by the "Brands Ordinance, 1900," as amended by the "Brands Ordinance Amendment Ordinance, 1908," I do hereby cancel and withdraw the Regulations, published under Government Notice No. 204 of 1900, and declare the following shall be in force in lieu thereof, from and after the 7th January, 1909 :—

1. The Registrar of Brands shall have his office in the Agricultural Department. With the exception of the Magistrate of Salisbury, the Magistrate in each district of Southern Rhodesia, and the Assistant Magistrate in each sub-district, shall be a deputy Registrar of Brands for the magisterial district or sub-district to which he is appointed. The offices of the Deputy Registrars of Brands shall be the offices of the several Magistrates.

2. (a) The form of application for registration of a brand shall be that marked "A" in the Schedule attached to this Notice.
- (b) The form of a certificate of registration shall be that marked "B" in the said Schedule.
- (c) The form of a transfer of a brand from one registered proprietor to another shall be that marked "C" in the said Schedule.
- (d) The form of a certificate of such transfer shall be that marked "D" in the said Schedule.

3. Each Deputy Registrar of Brands shall keep a register, in the form of Schedule "E" hereto, of all brands allotted within his district under the provisions of the Ordinance.

4. Save as hereinafter provided, every registered brand shall consist of two letters and a numeral of plain and uniform pattern; and the first of the letters shall indicate the magisterial district or sub-district in which the holding is situate on which the brand is to be used, and shall be placed above the numeral and letter comprising the brand, so as to be in triangular form.

5. One brand and no more shall be allotted to any person in one magisterial district or sub-district.

6. The size of the characters branded on stock shall not be more than three inches in height nor more than two inches in width.

7. An applicant for a brand shall be allotted the next vacant brand assigned to the district in which he is located, as set forth in Schedule "F" hereof.

8. Each Deputy Registrar shall keep a list of brands assigned to his district, for the inspection of applicants for brands.

9. There shall be payable to the Registrar or Deputy Registrar—

- (a) For every separate registration of a brand, 5s.
- (b) For every transfer of a brand, 5s.

10. All brands shall be imprinted on stock as follows :—

- (a) In the case of horses, mules or donkeys, the first brand shall be imprinted either on the near side of the neck or near rump, and any second or subsequent brand shall (where there is sufficient space for such purpose) be imprinted on the same part of such animal, and at a distance of not less than one and a half inches from and directly underneath last imprint, according to the table herein set forth.

Where there is not sufficient space for the purpose, then such second or subsequent brand shall be imprinted on the part of such animal next in order, according to the following table :—

- i. Off Neck or Rump (or Thigh);
  - ii. Near Shoulder (or Top of Arm);
  - iii. Off Shoulder (or Top of Arm).
- (b) In the case of cattle, the first brand shall be imprinted on the near rump or thigh of the animal, and every second or subsequent brand shall be imprinted at a distance of not less than one and a half inches from and directly underneath the brand last imprinted, according to the following table :—
    - i. Off Rump (or Thigh);
    - ii. Near Shoulder (or Top of Arm);
    - iii. Off Shoulder (or Top of Arm).
- (c) In the case of sheep and goats, the first brand shall be imprinted on the near shoulder, and all second or subsequent brands in the following order :—
    - i. On Near Side or Ribs;
    - ii. Near Rump (or Thigh);
    - iii. Off Shoulder;
    - iv. Off Side or Ribs;
    - v. Off Rump (or Thigh).
- (d) In the case of ostriches :—
    - i. On Near Thigh;
    - ii. On Off Thigh.



11. Each proprietor of a registered brand shall have the right, in addition to imprinting his brand in the manner above prescribed, to place such brand on the ears of such animals by punching, tattooing or ear-rivets.

12. The owner of any brand may surrender the same, and the Registrar shall, on receipt of notice thereof, cancel the registration by notice in the *Gazette*.

13. When it appears to the Registrar, upon the report of a Deputy Registrar, Native Commissioner, or Cattle Inspector, that a registered brand is not in use, he may cause notice thereof to be given to the owner thereof, calling upon him to shew cause why the same should not be cancelled; if cause is not shewn to the satisfaction of the Registrar within six months after such notice, he may cancel the brand.

14. No brand which has been surrendered or cancelled shall be re-allotted until a period of five years from such surrender or cancellation has elapsed.

15. The Registrar shall, at the end of each quarter in every year, or as soon thereafter as possible, transmit for publication in the *Gazette* a statement, in the form of Schedule "E" hereto, of all brands registered under the Ordinance up to the last day of such quarter.

16. The Registrar shall allot a brand to every public pound already or hereafter to be established, and shall register the same.

The first character of every such brand shall be a diamond, and the second the dominant letter of the magisterial district or sub-district, and the third a numeral, the dominant letter to be placed above the diamond and numeral, so as to form a triangle; and the Poundmaster shall, on sale of any stock impounded therein, brand the same with such brand on the portions and in the order prescribed in these Regulations, to shew that the said brand is the last brand at that time imprinted on such stock; and any Poundmaster who shall fail to comply with the provisions of this section shall on conviction be liable to a fine not exceeding £5.

No. 396 of 1912.]

[26th December, 1912.]

#### RABIES.

UNDER and by virtue of the powers vested in me by section 59 of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare all the districts of Southern Rhodesia to be an area coming under the operation of Part VI. of the said Ordinance, and I do further hereby publish the sub-joined regulations for preventing the spread of the disease known as rabies:

1. The regulations published under Government Notice No. 45 of 1909, as amended by Government Notices Nos. 284 of 1911 and 260 of 1912, are hereby repealed, but nothing herein contained shall affect the validity of current notices issued by the Administrator in terms of the said regulations.

2. Any Magistrate, Police Officer, Native Commissioner, Government Veterinary Surgeon, or other official vested with the performance of functions under the "Animals Diseases Consolidation Ordinance, 1904," may on its appearing to him that any dog or other animal is shewing symptoms which justify investigation as to whether such dog or animal is suffering from rabies or not, order the proper detention, isolation and control of such dog or animal, either in the hands of the owner or at some other suitable place.

3. Should any dog shew symptoms which lead to the suspicion that such dog may be suffering from rabies, the owner thereof shall forthwith notify the fact to the nearest official vested with powers under these regulations, who shall immediately report the same to the Chief Veterinary Surgeon, and shall either destroy the said dog or isolate and secure it for further observations.

4. On its appearing that any animal is actually suffering from rabies, any of the above-mentioned officials may order the destruction of such animal, or may himself destroy it, and may further take control of or destroy, if deemed necessary, any animal which has been in contact with a rabid animal or an animal suspected of being rabid.

5. The carcasses of all animals destroyed on account of their being infected with rabies shall be thoroughly burnt by the person or official destroying them, save that such parts as may be required for scientific investigation may be retained under proper precautions. In any case in which a human being has been bitten by a rabid animal, the head of such animal shall, if possible, be taken and sent to the nearest veterinary official.

6. (1) In the event of an outbreak of rabies occurring, the Administrator may, by notice in the *Gazette*, direct that all dogs within a radius of fifteen miles of such outbreak, or such other area as may be fixed, shall be kept in a safe enclosure or chained up for a period of not less than six weeks from such notification, or such other period as may be fixed, but may be taken out for exercise if kept on a chain or leash by the person exercising them.

(2) In the event of a suspected outbreak of rabies occurring, the Magistrate of the district may, and at the request of the Chief Inspector of Stock shall, direct that all dogs within a radius of fifteen miles, or such other area as may be deemed necessary, shall be kept in a safe enclosure or chained up for a period not exceeding four weeks, but may be taken out for exercise if kept on a leash or chain by the person exercising them.

(3) No dog shall be removed from any proclaimed area during such period of quarantine.

7. Notwithstanding the provisions of section 6 (1) and (2), packs of fox-hounds, harriers, or beagles, duly registered as such before the Magistrate of the district in which their owner or owners reside, may be used for the purposes of the chase when under the ordinary supervision and control of not less than two persons engaged in the chase.

8. Any person contravening any of the above regulations, or failing to carry out any of the provisions thereof, shall be liable, on conviction, to a fine not exceeding £10 for each offence; or, in default of payment, to imprisonment with or without hard labour for a period not exceeding one month.

9. These regulations shall come into operation on the 1st day of January, 1913.

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No. 336 of 1911.]

[26th October, 1911.

### RABIES.

THE following instructions regarding the treatment of persons bitten by rabid animals are published for general information.

In every case where a person has been bitten by a dog or other animal known or suspected to be rabid, the following precautions are recommended :—

- (1) The wound should be immediately and thoroughly cauterised. This, if it does not altogether prevent the disease, delays its onset sufficiently for Pasteur treatment to be successfully applied.
- (2) The patient should be sent to Salisbury for treatment at once. Delays are dangerous.
- (3) The fullest information should be sent to the Health Department as to date when bitten, locality, fate of dog, and especially reasons for supposing the dog to be mad.



[1st July, 1912.]

## RABIES.

SEVERAL cases have recently occurred where dogs having bitten a person or persons, were immediately destroyed and report made that they were possibly infected with rabies. In such cases it is impossible for the Veterinary Department to say in less than 18 to 20 days whether the animals were infected or not, and then only when the head of the dog concerned is received at the laboratory in a good state of preservation. Thus valuable time is lost in the treatment of persons bitten, which may lead to fatal results.

In all cases the suspected animal should, if possible, be secured by a strong collar and chain and the circumstances reported by telegram to "Veteran," Salisbury, when full instructions will be given as to the treatment and observation of the suspected animal.

### SUMMARY OF THE "GAME LAW CONSOLIDATION ORDINANCE, 1906," AND REGULATIONS ISSUED THEREUNDER.

The Ordinance divides the game into three distinct classes, described as follows :—

- (a) Birds and Small Buck.
- (b) Bushbuck, Hartebeest, Impala, Lechwe, Pookoo, Roan and Sable Antelope, Sitatunga, Tsessebe, Waterbuck, and Wildebeest.
- (c) Royal Game, which includes Eland, Elephant, Giraffe, Gemsbok, Hippopotamus, Inyala, Koodoo, Ostrich, Rhinoceros, Springbuck and Zebra.

The shooting season for Class "A" is as follows :—

In Mashonaland :

Birds from 1st May to 30th September.

Small Buck from 1st May to 31st October.

In Matabeleland :

Birds and Small Buck from 1st May to 31st October.

To shoot in Class "A" a licence costing £1 per annum is required. This entitles holders to hunt in both Provinces during the open season.

Class "B."—The season opens on 1st July and closes on 30th November in both Provinces. The licence fee is £25 for non-residents and £5 for persons having their domicile in Southern Rhodesia. This licence entitles the holder to shoot up to 15 head, which number may be increased to a total of 25 upon payment of a further sum of £15 in the one case and £5 in the other.

Class "C."—The Administrator may, if he is satisfied that the animals are actually required for scientific purposes, grant to the holder of a game licence permission to shoot or capture any of the species included in this Class. Such permit requires a £5 stamp. Applications in writing, together with proof of *bona-fides*, should be addressed to the Director of Agriculture.

Game for Farming Purposes.—Permits may be granted for the capture of Eland, Ostrich, Zebra or other animals for the purposes of breeding or farming. Such permits require a stamp of the value of £1 and remain in force for six months. Application, accompanied by a sworn declaration, should be made through the Director of Agriculture or the Civil Commissioner of the district.

Game Injuring Crops.—The occupier of any cultivated land or any person acting under the authority of such occupier, may at any time destroy game actually doing damage on such land.

Elephants on Occupied Farms, Melsetter.—The destruction of Elephants when found on occupied farms on the High Veld in Melsetter District is authorised (*vide* Government Notice No. 284 of 1908).



**Tsetse Fly Areas.**—Government Notices Nos. 201 and 227 of 1913 suspend the close season for all classes of game, with the exception of ostriches and other birds classified as game, within the following areas in the Hartley district and the Sebungwe district for a period of one year from 1st July, 1913 :—

**Hartley District.**—From the railway bridge on the Umfuli River, thence north-westwards along the Umfuli River to where it joins the Umniati River, thence southwards along the Umniati River to where it joins the Umsweswe River, thence eastwards along the Umsweswe River up to the drift at the Lydia Mine, thence along the old road from Lydia Mine to Etna Mine and to Inez Mine, thence northwards along the road from Inez Mine to Hartley, thence in the direction of the railway bridge to the starting point on the Umfuli River.

**Sebungwe District.**—From the confluence of the Sengwe and Lutope Rivers up the Lutope to its headwaters, thence in a south-east and easterly direction following the southern edge of the escarpment, leaving Meare's farm to the south, to the Mafungabusi Peak, thence northwards along the escarpment to the Njelele River, and down that river to its confluence with the Sanyati River, thence northwards down the Sanyati River to its confluence with the Piriwiri River, thence direct in a north-westerly direction to Picaninyemba, and thence along the footpath to Nenyunka on the Sengwe River, thence southerly up the Sengwe River to its confluence with the Lutope.

Game may be shot in these areas without a licence.

Game in Class "A" may be hunted in the close season until further notice on private land in the Melsetter district by holders of a licence.

**Protected Areas.**—No game may be hunted or killed within the limits of the Commonage or Townlands of Bulawayo and within a radius of two miles of the Court House, Gwelo, or within the Urungwe Game Sanctuary, as defined by Government Notice No. 237 of 1906.

"Locust Birds" are strictly protected, *vide* Government Notice No. 121 of 1907.

**Export of Game.**—No living Game or the Eggs of any Game Birds may be exported beyond the limits of Southern Rhodesia without a written permit.

**Shooting on Private Land.**—A licence does not entitle the holder thereof to shoot on private land without the permission of the land-owner.

No. 202 of 1913.]

[4th July, 1913.

#### HIPPOPOTAMI.

UNDER and by virtue of the powers vested in me by the "Game Law Consolidation Ordinance, 1906," I do hereby cancel Government Notice No. 114 of 1913, which suspended the operations of the said Ordinance in so far as it related to certain hippopotami in the Ingesi River in the native district of Insiza.

No. 228 of 1913.]

[24th July, 1913.

#### ELEPHANTS, HARTLEY DISTRICT.

UNDER and by virtue of the powers vested in me by section 4 (2) of the "Game Law Consolidation Ordinance, 1906," I do hereby suspend the operations of sections 9, 10 and 12 of the said Ordinance in so far as they relate to elephants on or within five miles from the farm Dawn, in the Hartley district, for a period of six months from date hereof.

No. 390 of 1912.]

[19th December, 1912.]

## PROTECTION OF LOCUST BIRDS.

UNDER and by virtue of the powers vested in me by the "Game Law Consolidation Ordinance, 1906," I do hereby declare that the following Locust Birds :—

- (1) Great Locust Bird or White Stork (*Ciconia alba*);
- (2) Lesser Locust Bird or Nordmann's Pratincole (*Glareola melanoptera*);
- (3) Small White Heron or Cattle Egret (*Bubulcus ibis*);
- (4) Wattled Starling (*Dilophus carunculatus*);

are added to class "A" of the said Ordinance, and shall be strictly protected, and not hunted or destroyed, throughout Southern Rhodesia for a period of five years from date hereof.

No. 240 of 1910.]

[1st September, 1910.]

## INSECT PESTS.

UNDER and by virtue of the powers vested in me by the "Nurseries Ordinance, 1909," I hereby proclaim the undermentioned insects to be pests within the meaning of the said Ordinance :—

- The Red Scale (*Chrysomphalus aurantii*).
- The Oleander Scale (*C. hederæ*).
- The Circular Purple Scale (*C. aonidum*).
- Ross's Black Scale (*C. rossi*).
- The Purple or Mussel Scale (*Lepidosaphes beekii*).
- The Long Scale (*L. gloverii*).
- The White Peach Scale (*Aulacaspis pentagona*).
- Woolly Aphis or American Blight (*Schizoneura lanigera*).

No. 259 of 1913.]

[21st August, 1913.]

## IMPORTATION OF PLANTS REGULATIONS.

UNDER and by virtue of the powers in me vested by the "Importation of Plants Regulation Ordinance, 1904," I do hereby declare that the following regulations shall, from date hereof, be in force and effect, and that the regulations published under Government Notices No. 141 of 1906, No. 133 of 1908, No. 228 of 1912, and No. 319 of 1912, are hereby cancelled.

1. In these regulations the following terms shall have the meanings respectively assigned to them if not inconsistent with the context and subject matter :—

- "British South Africa" shall mean the British Possessions and Protectorates in that portion of Africa lying south of the Zambesi River.
- "Chief Inspector" shall mean any person appointed by the Administrator for the purpose of carrying out in chief the provisions of these regulations.
- "Inspector" shall mean any person appointed by the Administrator for the purpose of carrying out the provisions of these regulations.
- "Plant" shall mean any tree, shrub or vegetable, and the fruit, leaves, cuttings, bark or any part thereof whatsoever, whether severed or attached.
- "Nursery stock" shall mean trees or plants of any kind, not being vegetables, grown or cultivated for the purpose of trade, and with the intention of their being sold, or distributed for the purposes of their being grown elsewhere than on the premises where they stand.



"Insect pest" shall mean any insect or other invertebrate animal which may be injurious to agricultural or horticultural products.

"Plant disease" shall mean any fungus, bacterial or other disease which may be injurious to agricultural or horticultural products.

"Nursery" shall mean any land or premises whereon is grown or cultivated any nursery stock, and includes any piece of ground adjoining such land or premises, and held by the same owner or occupier, on which are grown fruit trees, plants or shrubs not intended for sale.

"Nurseryman" shall mean the owner, occupier or other party responsible for the management of the nursery.

2. These regulations shall apply generally to any plant imported into Southern Rhodesia.

3. (1) Any plant, or any package, case, pot or other covering of the same, whether introduced by rail or by post, may, before being delivered to the consignee or addressee, be detained and examined by an Inspector for the purpose of determining as far as possible whether or not any insect pest or plant disease is present, and it shall be the duty of the consignee or his agent to open the coverings and to afford every facility to the Inspector during his examination.

(2) Such plants, together with all other articles in the same receptacle and including all packing material, may, when deemed necessary by an Inspector, as a precautionary measure against the introduction of any insect pest or plant disease, be treated by and to the satisfaction of the Inspector at the expense of the consignee or addressee, in default of which the consignment or package may be refused entry into Southern Rhodesia or destroyed by the Inspector.

(3) If any plant be found actually infested in whole or in part with any insect pest or plant disease it shall, together with all other articles in the same receptacle, and including all packing material, be cleansed by and to the satisfaction of the Inspector, or if any treatment at command be deemed by him ineffectual for the absolute eradication of the insect pest or plant disease, or if the Chief Inspector considers the insect pest or plant disease to be of a specially dangerous character, the consignment or package may, upon his instructions, be destroyed without delay, no compensation being paid.

(4) An examination fee of 1s. per each class of plant included in a consignment will be charged, and, in the case of plants calling for treatment, a fee of 5s. for each use of the fumigating chamber.

4. The inspection and treatment of any consignment imposed by these regulations shall take place on premises provided by the Government for the purpose, but special arrangements may be made with the Chief Inspector for the execution of all the provisions of Regulation 3 on the premises of the consignee or other place when approved facilities are provided.

5. On an Inspector being satisfied with respect to a consignment that all the regulations herein set forth have been duly complied with, he shall issue a certificate to that effect to the consignee or addressee, but before the issue of such certificate the consignment shall be under the Inspector's control for the purposes of these regulations.

6. The consignee shall, when called upon to do so by an Inspector, furnish a certificate with respect to any consignment, shewing the name and address of the consignor or shipper and the number and kind of packages, and any and all particulars of name, quantity, variety, grade marks and place of origin of the articles.

7. The Government does not hold itself responsible for any loss or damage that may result from the destruction of articles under these regulations, or from any process or detention that may be considered necessary or desirable to cleanse or disinfect the articles or to discover the existence or otherwise of any insect pest or plant disease.



## PART I.

*Regulations affecting Plants from outside British South Africa.*

8. No person shall introduce or cause to be introduced into Southern Rhodesia any plant from places outside British South Africa except by post or through the port of Umtali or the ports proclaimed under section 8 of the "Agricultural Pests Act, 1911" (Union of South Africa), as ports of entry into the South African Union, or such ports of entry as the Administrator may allow by special permit.

9. No person shall introduce into Southern Rhodesia from any place outside British South Africa—

- (1) any eucalyptus, acacia or coniferous plant or any portion thereof with the exception of seeds;
- (2) any stone fruit tree or any living portion thereof which was grown or produced in any part of North America in which either of the diseases known as peach yellows or peach rosette exists;
- (3) any live peach stones;
- (4) any stone fruits in their fresh state, including apricots, plums, peaches, nectarines and cherries;
- (5) any stocks (that is, young rooted plants intended for budding and grafting purposes) whatever, except those of the following, which may be imported in bulk only—that is to say, in quantities of not less than 1,000 :—

Almond,

Pear,

Plum,

Persimmon,

Cherry,

Northern Spy and other apple stocks which are accepted by the Chief Inspector as being resistant to the attack of woolly aphis (*Schizoneura lanigera*).

10. The introduction into Southern Rhodesia from places outside British South Africa of the under-mentioned plants or any portion thereof for propagation, with the exception of seeds and fruit, shall be limited to importations made under the direct supervision of the Government and subject to such precautionary measures as may be deemed necessary, namely :—

- (1) Grape vines or other plants of the family *Vitaceæ*,
- (2) Sugar cane,
- (3) Plants cultivated for the production of rubber,
- (4) Tea plants,
- (5) Coffee plants,

but this limitation shall not apply to the seeds or fruit of the above, except those of coffee.

11. No person shall introduce into Southern Rhodesia from any place outside British South Africa—

- (1) any flowering or ornamental plant,
- (2) any cotton seed,

except by special permission of the Director of Agriculture, who may grant or withhold such permission at his discretion.

12. (1) Subject to the foregoing, any other tree or fruit-bearing plant or scion or other part thereof for propagation may be introduced only after a special permit has been obtained from the Director of Agriculture. Such a permit shall only be issued at the discretion of the Director of Agriculture, and it shall limit the introduction to not more than ten trees or 100 cuttings of any one variety, and shall not be issued for more than an aggregate of 100 trees or 1,000 cuttings to any one person during any one year.

(2) For the purpose of this clause the term "tree" shall include any plant of the nature of a tree. In case of dispute as to whether any plant falls under this restriction, the decision of the Director of Agriculture shall be final.

## PART II.

*Regulations affecting Plants from British South Africa.*

13. No person shall introduce into Southern Rhodesia from any other part of British South Africa—

- (1) any cutting of any grape vine or any grape vine, unless the same is resistant or grown upon roots resistant to the attack of the grape phylloxera (*Phylloxera vastatrix*);
- (2) any apple stock or tree, unless grown upon Northern Spy roots or other roots which are accepted by the Chief Inspector as being resistant to the attacks of the woolly aphis (*Schizoneura lanigera*);
- (3) any tree or plant that was propagated beyond British South Africa, unless the introduction of the same would have been permitted under section 9 of these regulations.

14. No person shall introduce into Southern Rhodesia from other parts of British South Africa any nursery stock except under the following conditions :—

- (1) That the nurseryman from whom the stock is obtained holds a permit from the Director of Agriculture for the introduction of such nursery stock into Southern Rhodesia. Such permit shall be granted if the Director of Agriculture is satisfied from the report of the Government Entomologist of the colony or territory in which such nurseryman's premises are situated that no restriction on the removal of the stock would be imposed were the premises situated in Southern Rhodesia. Any such permit may be cancelled by the Director of Agriculture, and it shall expire twelve months from the date of the inspection on which it was based.
- (2) That any fruit tree, fruit-bearing plant and any portion thereof, other than fruit and seed, has been fumigated prior to shipment with hydrocyanic acid gas in a chamber.
- (3) That every consignment is accompanied by a certificate in the form detailed under Schedule "A" of these regulations, which specifies the numbers and kinds of plants contained in the consignment, and shews that the provisions of sections 15 and 16 of these regulations have been observed.

15. The introduction into Southern Rhodesia of any plant, not being seed, fruit, bulb, tuber, cut flower, vegetable or vegetable transplant originating in British South Africa, with the exception of nursery stock grown in a nursery registered at the Department of Agriculture, Pretoria, under the "Agricultural Pests Act, 1911" (Union of South Africa), and the introduction of any coffee seeds for the purpose of propagation, is prohibited, except under special permission from the Director of Agriculture, who may impose such conditions in regard to such importations as he may think fit.

16. No person shall introduce into Southern Rhodesia any grape vine, Virginia creeper or other plant of the family *Vitaceæ*, or any fruit or any portion thereof, with the exception of seed, from—

- (1) any of the following districts of the Cape Province :—

|              |                  |                |
|--------------|------------------|----------------|
| Aberdeen     | Albany           | Alexandria     |
| Bathurst     | Bedford          | Cradock        |
| Cathcart     | East London      | Fort Beaufort  |
| Graaf Reinet | Glen Grey        | Humansdorp     |
| Jansenville  | Kingwilliamstown | Port Elizabeth |
| Komgha       | Middelburg       | Somerset East  |
| Peddie       | Queenstown       | Tarka          |
| Stockenström | Stutterheim      | Uitenhage      |
|              | Victoria East    | St. Marks      |

- (2) the district of Barberton, in the Transvaal;

- (3) the county of Pietermaritzburg, in Natal.

This regulation shall not apply to grape jam, wine, brandy, vinegar or must.



## PART III.

*Potato Regulations.*

17. (1) No person shall introduce or cause to be introduced into Southern Rhodesia from outside British South Africa any potato tubers, unless he produces and delivers up to an Inspector—

- (a) a statement on oath from the consignor stating fully in what country and what particular place or places in that country the potatoes were grown, and containing particulars clearly establishing the identity of the consignment; and
- (b) a certificate from the Department of Agriculture of the declared country, or a certificate from some official institution of that country which the Director of Agriculture, Southern Rhodesia, has agreed to recognise in lieu of such Department, certifying at a date not more than thirty days before the time of the despatch of the consignment that the disease known as black scab or warty disease (*Synchytrium endobioticum*, Percival) has not been known to exist, so far as it is aware, within five miles of the place or places in which the potatoes are declared to have been grown.

Provided that the certificate made necessary by (b) shall not be required in respect of any consignment from a country—

- (i.) if the Government thereof has certified to the Administration of Southern Rhodesia that the said disease has not been known to exist in that country, and if that Government has undertaken to inform the Administration of Southern Rhodesia of any outbreak and if information recording an outbreak has not been received; or
- (ii.) if the consignee produces from the Department of Agriculture or other aforesaid recognised institution of the declared country of origin a certificate dated within nine months of the day of arrival of the potatoes concerned to the effect that the specified disease has not been known to exist, as far as it is aware, in the shire, county, department or other such territorial division comprising the place or places in which the potatoes are declared to have been grown, but, if required by an Inspector, the consignee shall deliver up an attested copy of the certificate herein provided for.

(2) Notwithstanding any provisions of the previous sub-sections, neither the certificate declaring the origin of the potato tubers nor that referring to warty disease or black scab shall be required in respect of potatoes imported from outside British South Africa into the South African Union and partly or wholly re-consigned to Southern Rhodesia.

18. Any consignment of potatoes imported from other parts of South Africa or from overseas, if found on inspection to be infested with the pest known as root gallworm or root knot eelworm (*Heterodera radicicola*) or with any other species of eelworm injurious to plants, will be refused admittance into Southern Rhodesia or destroyed.

19. Should any consignment on arrival be found to be infested with warty disease or black scab, it will be totally destroyed.

20. Any person guilty of a contravention of these regulations shall be liable to a fine not exceeding £10, or, in default of payment, to imprisonment with or without hard labour for a period not exceeding one month.

## SCHEDULE "A."

Certificate required with every consignment of nursery stock exported from the South African Union into Southern Rhodesia:—

I hereby certify that the plants herewith consigned, to wit, ..... bales ..... crates ..... tins, for the party of whom the address is given on the reverse side of this certificate, are produced from a nursery duly registered under the "Agricultural Pests Act, 1911," and that the



provisions of the regulations published thereunder, *inclusive of fumigation*, have been faithfully observed with respect to the same, and that I hold an *official permit for the introduction of these plants into Southern Rhodesia*.

Date.....

Registered Nurseryman.

#### SCHEDULE "B."

##### *Consignor's Declaration.*

Address.....

I, the undersigned, ....., member of the firm of ....., consignor of ..... cases, each containing ..... net weight of potatoes, for ..... purposes and marked ....., to be shipped per steamer ..... from ..... to ....., do hereby declare that the potatoes herein referred to were all grown at ....., in the district of ....., in .....

Signed .....

Declared at ....., this ..... day of ....., 191..., before me,

Name and title of officer administering oath.

#### SCHEDULE "C."

##### *Official Certificate re Black Scab.*

The undersigned, under authority of the Department of Agriculture of ....., hereby certifies that the potato disease known as black scab and warty disease, and ascribed to the fungus *Synchytrium endobioticum*, Percival, has not, as far as is known to the Department of Agriculture, been known to exist within five miles of ..... in the district of .....

Signature .....

Title .....

Address .....

Date and official stamp or seal

.....

No. 249 of 1908.]

[27th August, 1908.

#### PROTECTION OF TREES.

IT is hereby notified for public information that any person who shall cut down for use as fuel, or for any other purposes than *bona-fide* farming, mining or manufacturing purposes, or cause to be so cut down the "Wild Westeria" (native name M'Pakwa or M'poea) tree, will be liable to prosecution for contravention of the provisions of the Forest and Herbage Preservation Act, 1859, and upon conviction to a fine not exceeding £100, or to imprisonment with or without hard labour for a term not exceeding six months, or to such fine and imprisonment, or to such imprisonment without a fine.

No. 91 of 1913.]

[20th March, 1913.

#### DESTRUCTION OF WILD CARNIVORA.

IT is hereby notified for public information that His Honour the Administrator has been pleased to cancel Government Notices No. 216 of 1911 and No. 387 of 1911, as from the 31st instant, from which date rewards for the destruction of wild carnivora will be discontinued.

No. 211 of 1909.]

[16th September, 1909.

## PRODUCE FROM NATAL AND TRANSVAAL.

UNDER and by virtue of the power vested in me by section 8 (2) of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction from Natal and the Transvaal of the undermentioned produce thereof:—Grass, straw, hay, lucerne hay, forage, green lucerne, sugar cane, or any other bedding or fodder plant.

## FULL TEXT OF "HERBAGE PRESERVATION ORDINANCE, 1913."

AN ORDINANCE to prevent the destruction of Herbage, Trees and Shrubs by Fire.

BE IT ENACTED by the Administrator of Southern Rhodesia, with the advice and consent of the Legislative Council thereof, as follows:—

So much of the "Forest and Herbage Preservation Act, 1859," of the Colony of the Cape of Good Hope, and of any amendment thereof, as may be inconsistent with the provisions of this Ordinance, is hereby repealed.

Any person who shall, without lawful authority so to do, wilfully or by gross negligence set fire to or kindle any fire which by spreading shall set fire to any tree, shrub, bush, brushwood, undergrowth or grass not his property, shall be guilty of the offence of contravening this section, and shall upon conviction be liable to a fine not exceeding £100, or, in default of payment of any fine imposed, to imprisonment with or without hard labour for a period not exceeding one year, or to corporal punishment in any number of lashes or cuts with a cane or rod not exceeding fifteen, or to the above imprisonment without the option of a fine, or to any two of the above-mentioned punishments.

All Magistrates and Assistant Magistrates, and all Native Commissioners and Assistant Native Commissioners, in respect of persons over whom they have jurisdiction by law, shall have jurisdiction to impose summarily the punishment above set out.

The Court before which any conviction for a contravention of section two of this Ordinance takes place may, during or immediately after the trial, take and hear evidence as to the amount of damage caused by any contravention of the section, and may assess such damage to an amount within the civil jurisdiction of such Court and give judgment against the offender for the amount of the damage so assessed; provided always that such proceedings shall not be taken unless the offender has had reasonable notice that the amount of damage caused will be enquired into.

Nothing in this Ordinance shall be taken to affect the right of any person aggrieved to recover damages by civil action for any loss sustained by himself, unless he shall have availed himself of the provisions of section four hereof.

In such areas as the Administrator, on the petition of an actual majority of owners or occupiers representing not less than two-thirds of the land in such areas, may prescribe, any owner or occupier of land who desires to guard against fires crossing the boundaries thereof, may call upon the occupier of any adjoining land to contribute one-half of the labour or cost necessary to provide sufficient fire-guards on the common boundary. If any person so called upon shall refuse or neglect to contribute as aforesaid, the person so calling on him may proceed with the construction of a fire-guard and recover half the necessary cost of such construction from such first-mentioned person. The width of a fire-guard shall be such as the Administrator may prescribe at the instance of the petitioners, but in no case shall it be less than fifteen feet on each side of the common boundary. For the purposes of this section the term "owner or occupier" shall mean, in respect of native reserves, the British South Africa Company.

Any person who is lawfully upon the land of another or upon any road, outspan or vacant land, shall carefully and properly extinguish any fire



kindled or used by him, and until he has so done shall not proceed such a distance from any such fire as to be unable to control it by himself or his servants.

No person shall pursue any kind of animal, or knowingly enter upon the land of another with the intention of pursuing any kind of animal, without the consent of the owner or occupier of such land.

No person shall take or remove honey or bees from the land of another without the consent of the owner or occupier of the land upon which the honey or bees may be.

Any person trespassing upon any land enclosed by a sufficient fence, or being found upon such land away from a recognised road or path, shall be liable to the penalties hereinafter set out.

Every prospector proceeding to prospect for minerals, under and by virtue of any prospecting licence, upon occupied land, shall give notice to the occupier of his intention to prospect.

Every person, before proceeding to burn growing or standing herbage, grass or bush upon his own land, shall give reasonable notice to adjoining occupiers of his intention so to do. Such notice shall state as nearly as may be done the time at which such burning will take place.

Nothing in this Ordinance shall be taken to prevent a person, when his life, person, or property are in danger from an approaching fire, from setting alight to and burning grass, herbage, or bush, in the manner commonly known as counter-firing, in order to prevent such injury or loss; provided that reasonable care is taken that a fire kindled does not spread beyond the limits necessary to secure safety from injury and loss.

If any servant when acting under the direction or command of his employer by omission or by act of commission shall contravene any of the provisions of this Ordinance, then such employer and the servant may both or either of them be prosecuted, and if convicted punished under this Ordinance.

The penalties for any act or omission in contravention of the provisions of this Ordinance shall be, unless otherwise specifically provided—

- (1) for the contravention of sections eleven and twelve a fine of £5, or in default of payment of any fine imposed, imprisonment with or without hard labour for a period not exceeding one month;
- (2) for the contravention of sections seven, eight, nine and ten a fine of £10, or in default of payment of any fine imposed, imprisonment with or without hard labour for a period not exceeding three months;

provided that should any act or omission complained of also result in a contravention of section two, prosecution may follow under that section.

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## Department of Posts and Telegraphs,

Southern Rhodesia.

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Postal Notice No. 12 of 1913.

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### AGRICULTURAL PARCELS POST.

IT is hereby notified for public information that, on and after the 1st August, 1909, any article produced, and, if manufactured, produced and manufactured within Southern Rhodesia may be transmitted by Agricultural Parcels Post at the reduced rate of threepence per lb. or fraction thereof, up to a limit of eleven lbs. in weight.



The Agricultural Parcels Post is designed to bring the producer into direct communication with the consumer, and is available for the transmission of :—

|                        |             |              |
|------------------------|-------------|--------------|
| Biscuits               | Dried Meats | Plants       |
| Bread                  | Eggs        | Poultry      |
| Butter                 | Flour       | Seeds        |
| Confectionery          | Flowers     | Sugar        |
| Cigarettes             | Honey       | Tobacco      |
| Dried & Bottled Fruits | Jam         | Wool Samples |

and other articles produced within Southern Rhodesia. It does not extend beyond the borders of Southern Rhodesia.

The senders of articles at the reduced tariff applicable to the Agricultural Parcels Post will be required to sign a declaration that the contents are the *bona fide* produce of Southern Rhodesia.

The limits of size and weight, and the general regulations, are those applicable to the Inland Parcels Post.

G. H. EYRE,  
Postmaster General.

General Post Office, Salisbury,  
31st March, 1913.

#### REDUCED RATES FOR MEALIE MEAL.

THE Beira and Mashonaland and Rhodesia Railways announce that, with effect from 1st June, 1913, an amended scale of rates will apply to Mealie Meal, particulars of which may be obtained from the Traffic Manager or Stationmasters. As a temporary measure, the revised scale will apply also to Meal manufactured from imported Maize.

#### RATES FOR MOLASSES FOR STOCK FEEDING.

THE Beira and Mashonaland and Rhodesia Railways announce that, with effect from date hereof, Molasses for stock feeding will be conveyed from Beira to Salisbury, as a temporary measure, at half third-class rate, owner's risk.

#### RATE FOR GRAIN.

THE Beira and Mashonaland and Rhodesia Railways announce that the rate of  $\frac{1}{4}$ d. per ton per mile quoted on page 100 of Tariff Book No. 6 (page 52 of South African Railways Supplement to Tariff Book No. 3) for Grain in 15-ton lots to stations south of Francistown applies to Grain and Meal, the produce of Rhodesia or the Tati Concessions, exported for consumption beyond the boundary of these Territories.

#### REDUCTIONS IN RATES.

THE Beira and Mashonaland and Rhodesia Railways announce that reductions in rates as previously advertised, to operate from a date to be agreed upon with the Chambers of Commerce in Rhodesia, will be brought into effect from the dates specified hereunder :—

September 1.—Cement and Timber.

October 1.—Petrol in solid iron or steel drums. Class rates Salisbury—Gwelo and Blinkwater Branch.

Live Stock and Vehicles, Beira—Salisbury Line.

Public Telegrams, Beira—Macequece Line.

December 1.—Galvanised Iron, Angle Iron, Bar Iron, etc., articles of a heavy and undamageable nature used in connection with mining.

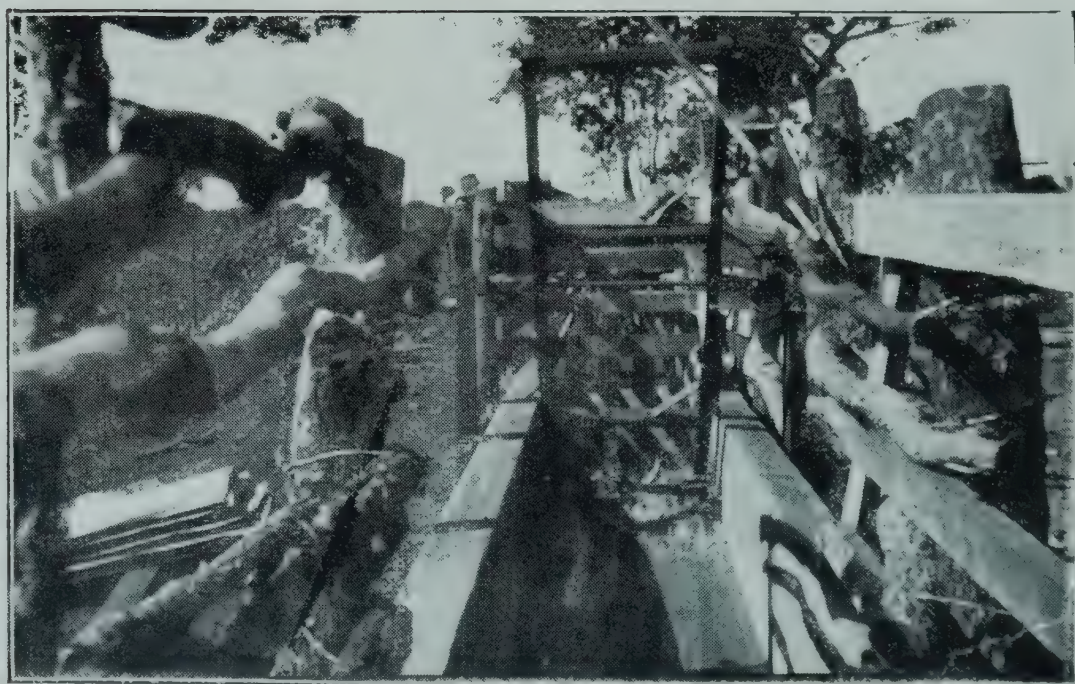
January 1, 1914.—Fencing Material.

A Rates Supplement to Tariff Book containing full particulars of the alterations may be obtained at all stations.





“ Simplex ” Dipping Tank—Side view.



“ Simplex ” Dipping Tank—End view.





# THE RHODESIA Agricultural Journal.

*Edited by the Director of Agriculture,  
assisted by the Staff of the Agricultural Department.*

PUBLISHED BI-MONTHLY.

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## Editorial.

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*Correspondence on subjects affecting the farming industry of Southern Rhodesia is invited. Enquiries will be replied to direct, or through the medium of the JOURNAL. An interchange of ideas and suggestions between farmers will be particularly welcomed. Contributions of a suitable nature for insertion in this JOURNAL will be much appreciated. All communications regarding these matters, and advertisements, should be addressed to the Editor, Department of Agriculture, Salisbury.*

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DIPPING TANKS.—The subject of the construction of dipping tanks is one very much before the public at the present time. In this Journal will be found an article dealing with the subject at length. The plans and specifications previously issued have been amended as the result of experience gained and suggestions received from several different quarters. In this connection special thanks are due to Mr. M. E. Weale, of Shangani, for practical hints, the outcome of his experience in personally erecting a dipping tank. It is hoped that the instructions now given will enable any practical farmer who is handy with tool to build a tank for himself, and thereby materially reduce the cost. These drawings and instructions

can only be regarded as of a general character and an approximate guide; modifications will suggest themselves according to individual circumstances and tastes.

A patent known as the "Simplex" dipping tank is at present prominently before the public. Three have been erected in Rhodesia. The accompanying photographs indicate the nature of the procedure whereby animals in passing through a tank of special design much smaller than that in ordinary use to-day are forcibly submerged by means of an oscillating structure, which presses down the head, wetting thereby the face and ears. So far as can be judged from watching this appliance in operation, it does not appear that it offers any advantage over that in general use, except perhaps in the case of owners of stock few in numbers, whose herds are not likely at any time to be of considerable dimensions.

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**COMPULSORY DIPPING.**—The question of compulsory dipping, that is, the enforcement of dipping over large areas of the country, is agitating those communities where tanks have now become numerous. In terms of Ordinance 2 of 1911, regular dipping is being put into force in regions where the existence of African Coast Fever justifies such action. The application of the principle over wide areas where no disease exists can only be carried out subject to the provision of the necessary facilities, that is, of dipping tanks, and until these are general, it is not feasible to compel regular dipping.

Helpful as isolated tanks are to the individual owners, they are yet far from conferring that sense of security to the whole community which exists where every farm has a tank, through which all the stock are regularly passed.

The desire to have tanks is extending very rapidly, and the merits of dipping are becoming generally understood. Wherever introduced, dipping has firmly established itself, and is not likely to be discontinued, though a few exceptional cases have come to our notice where tanks have been erected but not put into use. It is for such and for the backward minority that compulsion is necessary.

Government assistance has been strained to the utmost to meet as far as possible the numerous applications for grants-in-aid for the construction of tanks, and the funds available have proved inadequate to the constant and growing demand. This question of State aid is at present receiving consideration, with a view to expending such funds as may from time to time become available to the best advantage, and to encourage a systematic and general dipping, on which it is now realised the safety of the cattle industry so largely depends.

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LAND SCHEME.—The publication of proposals for the encouragement of land settlement and immigration in Rhodesia by the British South Africa Company marks an epoch in the economic progress of the industry of Rhodesia. The proposal cannot be regarded as revolutionary in character, but rather as a natural step in the evolution of Rhodesia and the logical outcome of the progress of the country during the past twenty years. During the last few months, and quite apart from the scheme now before the country, various land-owning companies and individuals have been formulating schemes for the subdivision of their land, and there are quite a number of such at present in process of development privately.

There can be but one opinion as to the desirability of bringing a population of active producers on to the land as rapidly as is consistent with its capacity to absorb them. The more capital each individual immigrant brings with him into the country the better, and it is recognised that there is little or no scope for the indigent settler.

The labour supply has its limit, and the newcomer must generally face the difficulty of ignorance of the language and the suspicion with which our natives usually regard strangers. Although the amount of breeding stock available is also somewhat restricted, the conditions in this respect are improving very rapidly. The suitable class of settler for Rhodesia, possessing both farming knowledge, energy and perseverance, can probably be found in adequate numbers, provided sufficient inducements are held out to him. The large measure of success which has rewarded early immigrants to this country is perhaps



the best justification to others to follow. It is sometimes contended that the markets are insufficient, but there can be no doubt that these will expand as supplies increase, and as soon as quantities become sufficient to justify the use of economical means of wholesale distribution and commercial methods of disposal, markets will come into being, either through co-operation or through the services of middlemen. With many commodities the most difficult stage is that when the supply exceeds local requirements, but does not at that time justify organised means of reaching distant markets.

The subject will no doubt receive careful and individual attention between now and the time when the Legislative Council will give its sanction and statutory authority to the scheme ultimately adopted.

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**BORING FOR WATER.**—It will no doubt be of interest to farmers and others to learn the results of the operations of the three boring machines purchased by the Commercial Branch of the British South Africa Company to assist farmers in developing the underground water supplies of their properties. Two machines have been operating for approximately five months, the third for four months. The subjoined statement represents the work accomplished during that period.

From this statement it will be observed that seventeen boreholes have been sunk, with a total footage of 1,676, or an average per borehole of, say, 98 feet. Two of these boreholes were abandoned on account of unfavourable formation, and a third was blank. The total quantity of underground water which has been tapped by these drills for stock and other purposes aggregates some 233,680 gallons per diem. It might be mentioned in regard to holes Nos. 3, 10 and 16, that the figures given merely represent the capacities of the pumps employed in testing, and that as there was no appreciable lowering of the water level in these boreholes during pumping operations, it is probable that these figures might be more than doubled.

The cost per foot, including casing, has so far averaged, approximately, 13s., which, but for delays in transport of machinery and in the supply of water for working the drills, could have been reduced.

The results so far obtained compare most favourably with those attending similar operations in the Union, and prove that ample supplies of subterranean water exist in Southern Rhodesia as well as in the more southern Provinces of the Union, while the quality has been distinctly superior, as in none of the holes so far completed has the water proved brackish.

| No. of Hole | Name of Owner     | Name of Farm and Locality | Depth of Hole in feet | Yield of Water in gallons per diem | Formation            |
|-------------|-------------------|---------------------------|-----------------------|------------------------------------|----------------------|
| 1           | C. W. Adams       | Winslay Estate, Inyati    | 75                    | 50,000                             | Schist               |
| 2           | do                | do                        | 98                    | 6,240                              | do                   |
| 3           | R. A. Fletcher    | Umvutcha, Bulawayo        | 55                    | 500                                | Granite              |
| 4           | do                | do                        | 127                   | 900                                | do                   |
| 5           | H. P. Fynn        | Valley Farm, Bambesi      | 85                    | 7,400                              | do                   |
| 6           | H. H. Williams    | Portive, Inyati           | 99                    | 28,800                             | Schist               |
| 7           | S. M. L. O'Keeffe | Clonmore, Bambesi         | 46                    | Nil                                | Granite              |
| 8           | do                | do                        | 99                    | Nil                                | do                   |
| 9           | H. T. Fynn        | N'Duba, Bambesi           | 72                    | 21,600                             | Schist               |
| 10          | B. I. Collings    | Sabonabon, Gatooma        | 126                   | 42,000                             | do                   |
| 11          | do                | do                        | 127                   | 14,400                             | do                   |
| 12          | G. Fitt           | Cherrybank, Gatooma       | 144                   | 24,000                             | do                   |
| 13          | C. Kanngieser     | Walmer Park, Gatooma      | 151                   | 9,000                              | do                   |
| 14          | T. E. Speight     | Lowood, Gadzema           | 116                   | 3,600                              | Quartzite            |
| 15          | do                | do                        | 34                    | Nil                                | do                   |
| 16          | B. Bester         | Mapani, Bulawayo          | 127                   | 16,800                             | Schist               |
| 17          | R. Aserman        | Imbezu Estate, Heaney     | 95                    | 8,440                              | Sandstone and Basalt |
|             |                   | Totals                    | 1,676                 | 233,680                            |                      |

WINTER CEREALS.—The area under winter cereals in Rhodesia is increasing annually. Not only do wheat, oats and barleys do well under irrigation, but they also produce excel-

lent crops on damp vleis, where the permanent moisture is sufficient both to germinate the seed and maintain the plant until maturity. A very fine area of irrigated cereals is to be found on Mr. Jelliman's farm, Macheke. Here the enterprising owner has grown during the past winter season about 250 acres of oat forage and about 100 acres of wheat. The oats are of excellent quality throughout. The wheat is more uneven, but the main crop, to which a light dressing of artificial manure was applied, would be difficult to equal anywhere. Mr. Jelliman has imported a "Sunshine" harvester for his wheat. This machine moves slowly through the crop, and harvests the ears of wheat only. These are borne upwards by an endless band, and subsequently threshed and winnowed, and the grain delivered into bags attached at the side. In an irrigated crop of winter wheat, one of the greatest troubles that the farmer suffers from is "blind" or empty ears. These are apt to occur in large quantities, and to reduce very considerably the total yield of grain. It has been observed that they occur very frequently on black land rich in humus, the excess of nitrogen being here the cause; but an additional cause is undoubtedly the action of frost on the ears as they come into flower.

Farmers who formerly suffered report that the trouble ceased when the wheat was sown later, say in May, so that the flowering period did not occur until the frosts were safely over. Other farmers have retarded the flowering period by grazing down the wheat during the earlier stages of its growth. It is worthy of note that oats do not suffer in the same way, and it is common practice to use these black lands for oat forage, where wheat fails to set seed satisfactorily.

Winter cereals, whether grown under irrigation or on naturally moist vleis, as described by Mr. W. J. B. Harris in an interesting contribution to this issue, are now becoming a frequent feature all over the country, and may be found on our extreme borders at Umtali, Melsetter and Plumtree, as well as in the Midlands round Insiza, Somabula, Gwelo and Charter. The possibilities in this direction have been amply proved, and the practice is rapidly extending.



CO-OPERATION.—Instances of co-operation amongst the farmers of this country are becoming more numerous, and it is evident that the policy of mutual help, which is now so universally adopted throughout the world, is beginning to make headway in Rhodesia. The latest instance which has come to our notice is at Vungu, in the Gwelo district, where farmers have co-operated for the marketing of their produce. Mr. Erasmus's farm has been made the central depôt. Here the farmers send their cream, eggs, etc., every week, and they take it in turns to transport the produce of the district into Gwelo and place it on the market. The farmer who conveys the produce to town is also commissioned to make purchases for the members of the society, and this means that each individual makes his trip to town at much greater intervals than otherwise, and with consequent economy to himself. This is a system which might with advantage be adopted in other districts, and we commend it to the consideration of farmers situated in groups and at a distance from their markets and stations.

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FAT STOCK SHOW AT SALISBURY.—We would draw attention to the fat stock show and sale being held by Messrs. Whitfield & Co. at the Show Ground, Salisbury, on Saturday, 20th December. The show is, we believe, the first of the kind, and, the idea being a highly commendable one, we trust it will be well supported. Various valuable cups and gold medals are offered for competition, and all stock entered is to be sold without reserve. Entries close on 17th December. This may, if successful, prove the commencement of an annual Christmas Fat Stock Show, interesting and instructive to visitors and helpful to farmers in opening up markets and advertising their wares.

## The Construction of Dipping Tanks for Cattle.

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The general recognition of the great value of dipping cattle, both as a preventive of disease and for the maintenance of condition, has led to frequent demands for guidance in the erection and use of tanks. Much attention here and in other countries has been given to this subject, and plans and specifications are now approaching that uniformity which indicates practical finality, and differences of design are mainly in detail and not in principle. Whilst the accompanying drawings may be taken, therefore, as generally applicable, they are meant to serve only as an indication of dimensions, specifications and accessory requisites of a serviceable and economical dipping tank, and are subject to modification to suit individual ideas and circumstances. Considerable elaboration is possible, but much curtailment is not recommended, as the plans have been prepared with a strict view to economy, consistent with efficiency. The alterations in the accompanying design compared to that previously issued, though not very great, are not unimportant, and may be regarded as improvements based on experience. The plans are to serve as a model of general applicability, and hence are not intended to be slavishly followed in every instance. Throughout the specification and description, trade technicalities have as far as possible been avoided, and such simplicity aimed at that a farmer or handy man may build a tank without recourse to the services of a skilled builder or contractor.

Select a site as near as possible to permanent water, on firm and solid ground; avoid swampy ground or great difficulties may be experienced. If the site is level, fill up the space to be occupied by drip yards with excavated material until sufficient rise is obtained to secure efficient drainage.

Excavate the pit to the size and shape shewn on drawings. To do this carefully mark off the centre line and other dimensions of the tank with wood or iron pegs. Cut down the sides

to a straight face, and be careful not to excavate more material than is shewn, otherwise it will necessitate the space excavated being filled with concrete at an additional and unnecessary cost. Cart away or level round the site the excavated material not required for filling in. Provide a mixing board of planks or boards, bedding firmly on sand—10 ft. by 10 ft. is a convenient size—and fasten same together by driving in pegs on the outside. Cover with sand, and with a broom or shovel work the sand into all the joints until the platform becomes firm and solid.

Provide sufficient pine timber for constructing the framework, which should be carefully done. A little extra time occupied in this will be saved many times over at a later stage, whereas a carelessly or badly constructed frame will occasion much difficulty in keeping the walls straight and true to batter, and add considerably to the cost in finishing. Pine timber 3 in. by 2 in. is suitable for struts, braces, and uprights, and if placed at suitable distances the lining boards need not be more than 1½ in. thick, and of any convenient width.

The strength of concrete varies considerably, according to the quantity and the quality of the cementitious material used, also according to the nature of the aggregate employed. A coarse, clean sand and broken metal with sharp edges and irregular surfaces gives a material of greater strength than that produced by fine sand and rounded water-worn pebbles, because a better surface is offered for the interlocking of the crystal formation. Stone ballast for the concrete should consist of the best clean granite or quartz, broken in angular pieces, no stone to be larger than will pass through a 1½ in. ring (any way). The stone ballast used must be thoroughly clean, or if not must be well washed before mixing. Water must be clean and free from organic impurities. From 21 to 24 gallons of water are required for every cubic yard of dry material. The sand should consist of the best clean, sharp, granite grit, free from clay, loam, or vegetable matter, and if necessary, thoroughly well washed before using. The quality and proportion of the sand used are important factors in producing good work. It should not be too fine in grain, or the particles to be united together become too numerous for the quantity of cementitious material employed; it should be free from muddy or clayey particles, as these deleteriously affect



the formation of crystalline silicates of lime and alumina, without which the proper setting or hardening of Portland cement cannot take place. For the best results the mortar consisting of cement and sand should be in just sufficient quantity to fill up the interstices of the stone ballast and produce a compact mass when the whole is bound together. Before commencing to lay concrete the bottom of all excavations must be damped and well rammed. Well ram all round the walls of the tank as the work proceeds. The whole of the materials should be accurately measured in boxes or empty cement casks. The cement should be Portland, and of the best quality obtainable. The concrete should be composed of five parts broken stone, three parts good, sharp sand, and one of cement, to be turned over twice in a dry state and twice in a wet state, and when laid in place to be thoroughly well rammed. The concrete must be mixed on a wooden or iron platform, and not on the bare ground. The water must not be thrown on in buckets, but sprinkled on through a fine rose. The concrete must be laid down as soon after mixing as possible. In mixing concrete, old material must not be incorporated in the new mixing. All concrete should be laid in boxes made with  $1\frac{1}{2}$  in. boards, and no layer should exceed twelve inches in height. Every old layer must be thoroughly cleaned and slightly damped before commencing to add a fresh layer. It is most important that the mixing is thorough, because it is in an imperfectly mixed concrete that cracks and flaws are liable to appear. The best way is to mix the sand and cement together thoroughly in a dry state, then place the stones on the top, mix well together dry, then add the water through the rose of a watering-can, and turn the wetted mass over at least twice before laying. Only sufficient concrete should be wetted and mixed as is immediately required.

Sometimes in the case of soils liable to much expansion and contraction, a good plan is to lay down a bed of clean, sharp sand, 6 in. or 12 in. thick, on which the concrete is subsequently placed. This better distributes the pressure, and will often prevent unequal settlement. It is also a good plan to reinforce the floor, slope, and walls with steel bars, which combine with the concrete in such a way as to prevent fracture. After thoroughly consolidating the ground by ramming, lay the floor of drip yards with 4 in. of concrete as described above.





A typical Dipping Tank.



A Dipping Tank in use.





packed to a regular grade and finished with the rammer. After completion, and while yet green, prepare a liquid grout of one part of cement to one of sand, run it over the same, and brush over lightly with a straw or bass broom; form the necessary channels in same for conducting the drippings to the well. All concrete must be kept well watered and covered with damp sacks or grass as the work proceeds, and all walls should be kept well wetted for a week after completion. The floors of tank, race and draining pen should be covered with wet sand for 14 days after completion. The floors of race and draining pen ought to be V jointed, diagonally from the centre to sides every 18 in., joints  $\frac{1}{4}$  in. deep. All concrete must be thoroughly well rammed. The concrete must be laid as quickly as possible, and the whole of the materials must be on the ground before commencing to mix them. All concrete should be mixed under supervision, and the contractor should give due notice of his intention to lay the same before commencing work.

Before putting up the framework, lay the floor and inlet and exit slopes with concrete to the dimensions shewn on the drawing, and prepare for same by carefully levelling and driving into the ground fine iron pegs or pins, which should project above the surface of the ground to the face of the concrete; put in similar pins up the slopes. In laying the concrete these will be useful for guides, and for working the straight edge from point to point.

The laying of the floor first is a most important matter, and cannot be too strongly insisted upon, as cracks which have sometimes appeared in the walls have been traced to a departure from the specification in this particular. By laying the floor first, and taking special care at the junction of the slope, a wide slab of concrete is constructed on which the walls are subsequently built, and if the work is well done, any tendency of the superincumbent walls settling will be rendered fairly uniform, and the dangers of irregular settlement considerably minimised. Build in four rows of barbed wire all round the walls—four wires in each row. The first should be placed 12 in. from the floor, then at intervals of 1 ft. 10 in. apart, well tied to iron uprights at the angles. This will further help to prevent irregular settlement taking place. Lay

the wires in the position shewn on section, to run right round the tank, and all to unite; top, bottom, and side wires. Wire to be four-barb, two-ply, with barbs 6 in. apart. All wiring must be drawn taut.

The surface of floor in race, in draining pen, and bottom of tank must be floated up with one of cement to three of sharp sand, to be well trowelled and brought to a smooth, fine face. The edge of floor of race, at entrance of tank, must be rounded. The surface of slope leading out of tank is to be finished rough, for foothold of cattle, by racking up the surface after ramming or by introducing rails. The floor of draining pen must be 4 in. thick at the sides, and slope  $\frac{1}{2}$  in. towards the centre. Near the exit of tank leave a hole in the floor of draining pen to be 3 in. in diameter, fitted with a 3 in. outlet pipe. Fit a wooden plug with an iron top and ring. The plug must be left in place when dipping, and should be removed during rains to prevent rain water running into the tank. On each side of the dripping race lay a dwarf wall of concrete, to be 4 in. wide, to prevent dip washing over the floor of race when cattle enter the tank. The wall will start from ground level, and will be 9 in. at the end near tank. After completion plaster the walls and floors of tank with one of cement and three of sharp sand, steel trowelled, to be not less than  $\frac{1}{2}$  in. thick; walls well roughened and wetted before applying the plaster. Plastering should not be attempted in the heat of the day, nor during a frosty morning or evening. The plastering should if possible be completed in one day, and should be applied while the concrete is still "green."

The entrance to the tank has been altered to prevent cattle trying to jump out sideways, instead of plunging into the dip. Some tanks are built narrow at the entrance for this purpose and to economise concrete, but this entails additional difficulty and labour in construction, involving more expense. The ledge, which allows of handling stock in difficulties, does not extend the whole length of the tank, but terminates within nine feet of the entrance, so as to prevent stock from using it to try to avoid the plunge. Beyond this ledge is the splash wall, which may be built in brick, faced or pointed in cement. All important dimensions are indicated on the drawings, and these should be strictly adhered to, unless it has been decided



beforehand to construct the tank to other dimensions. The exit should be provided with ridges to give a grip to the feet, for which cement or short lengths of rail, pipes, or 16 lb. fence posts are admirably adapted. The whole of the posts may be of Mopani or Mohobohobo, or some similarly suitable native timber, which should be not less than 5 in. diameter at the small end, stripped of bark and well carbolineumed before erecting. The race will be formed of poles or rails as shewn on plan. Posts for yards should be not more than 10 ft. from centre to centre, let into ground 18 in., and well rammed. All posts must be 6 ft. above the ground, and free from knobs or projections. Well spike to posts round the whole of the yards and enclosures three or more  $4\frac{1}{2}$  in. by  $1\frac{1}{2}$  in. rails, all well carbolineumed before fixing. The posts must be dressed quite clean to prevent injury to cattle. Rails may be deal, clean and free from knots and splints. Native timber may be used for rails if procurable, but it must be straight and quite free from knobs or projections that might cause injury to animals. A few slip rails should be available in order to prevent cattle from backing out of the entrance race. Such rails might be of smoothed native timber about 4 in. diameter.

Both the entrance and exit race may be built either straight or curved, as may be found best suited on the site selected and for the arrangement of the kraals. On the accompanying drawing these are for convenience shewn straight.

The size of the collecting kraal will depend upon the numbers to be handled at one time, and as a guide, 18 square feet per beast may be regarded as a convenient allowance, though a kraal 60 feet by 30 feet would accommodate about 100 head comfortably. Drinking water should be provided in troughs in this yard, or somewhere convenient for the stock before entering it, as animals entering a dipping tank suffering from thirst are very liable to drink from the dip as they pass through. On leaving the dripping race it is well to keep the herd in a resting kraal till dry to prevent poison being distributed on the surrounding veld. The tank itself should for similar reasons be fenced off from adjacent ground for a distance of about five yards all round. Within this space drums of dip and any appliances used in dipping may be kept. The tank or sump for the reception of the old dipping fluid when the dipping tank is being cleaned out should be similarly



protected. When the walls and floors have become dry, select a warm day with good sunshine, and coat the whole of the floor, exit, and inlet slope and walls up to the water line with hot coal tar, well boiled, with 1 lb. of pitch added to each gallon of tar. When the same has become dry it should receive a second coat of the same material, which should be well worked into all corners and angles. This will tend to close the pores and prevent undue absorption. One gallon of tar and 1 lb. of pitch will cover 11 square yards the first coat, and a larger area the second coat. In filling the tank for the first time a certain quantity of fluid will be absorbed and lost through leakage and absorption. These losses, however, may be expected to become reduced as the tank is refilled and the minute particles in the water or dip fill the coarser interstices of the concrete.

The quantities of material required are as follows:—

*Pipes—*

- 10 pieces  $1\frac{1}{2}$  in. diameter pipe, 6 ft. long, across exit.
- 1 piece 3 in. diameter pipe, 4 ft. 6 in. long.
- 1 piece 3 in. diameter pipe, 1 ft. 9 in. long.

*Timber—*

- Rails, 6 pieces 12 ft.,  $4\frac{1}{2}$  in. x  $1\frac{1}{2}$  in.
- Rails, 12 pieces 14 ft.,  $4\frac{1}{2}$  in. x  $1\frac{1}{2}$  in.
- Rails, 48 pieces 20 ft.,  $4\frac{1}{2}$  in. x  $1\frac{1}{2}$  in.
- Slip rails, 6 pieces 10 ft., 3 in. x 3 in.
- Slip rails, 3 pieces 15 ft., 3 in. x 3 in.
- 80 posts, 5 in. diameter, 7 ft. 6 in. long.
- 30 posts, 5 in. diameter, 8 ft. long.
- 9 pieces, 15 ft. long, 9 in. x  $1\frac{1}{2}$  in., deal.
- 3 pieces, 17 ft. 6 in. long, 9 in. x  $1\frac{1}{2}$  in., deal.
- 4 pieces, 11 ft. long, 9 in. x  $1\frac{1}{2}$  in., deal.
- 2 pieces, 7 ft. long, 9 in. x  $1\frac{1}{2}$  in., deal.

(Native wood may be used in the place of imported timber.)

- $1\frac{1}{2}$  coils barbed wire.
- 15 gallons carbolineum.
- 50 lbs. 5 in. spikes.
- 44 casks cement.
- 33 cubic yards broken stone.
- 24 cubic yards sand.
- 1,600 bricks.

The entrance race should, where possible, incline slightly upwards to within a short distance of the tank so as to keep back dirt, dung and liquid from polluting the tank, and the last few feet only incline towards the tank. This is shewn on the drawings, but may not always be practicable. The entrance race must be strongly built to withstand the pressure of the cattle, and may either consist of rails of native wood, not more than one foot apart, or of  $1\frac{1}{2}$  in. boards. The wings extending from this fence over the tank should be made of planks to prevent animals seeing out over the side, and so being tempted to get out that way. The posts must be securely fixed and supported with strong stays. Old rails are often used for this purpose. The dripping race should not be less than fifteen yards long, and additional length implies further saving in the dip draining off, especially where large numbers are to be handled and the animals are not allowed to stand in this race. The return of dip from the dripping race into the tank and the diversion of rain water falling on the race is provided for by pipes through the kerb edge, one leading outwards, the other passing back into the tank as shewn on the drawings. Another method is to carry a pipe through the kerb into a small settling cistern (say, 12 in. x 18 in. x 24 in. deep) constructed alongside the dripping race, and out of which a second pipe leads back into the tank at a lower level after sediment has been deposited. By means of wooden plugs, the dip or rain water from the dripping race may be carried into the tank or drained away. A dripping race has been found generally more convenient and much cheaper than a draining pen, though some prefer the latter.

A pulley tackle is a great convenience for dealing with obstreperous beasts. The rope may either be adjusted round the horns, or a large loop carried right over the back, under the tail, and along the flanks, a method which renders resistance of little avail.

The following schedule gives the approximate capacities of a tank built strictly to the dimensions shewn on the drawing, but as it is only in very rare instances that tanks are built exactly to these dimensions, it should serve as a guide only, and is not to be relied upon when mixing the dip. The only accurate method of ascertaining the capacity of any dipping

tank is by means of introducing the dip (or water) from a smaller tank (or buckets) of known dimensions. A tank of, say, 100 gallons capacity could be erected in such a position that its contents can be emptied into the dipping tank. The level attained by each emptying, which in this case is equivalent to 100 gallons, can then be indelibly marked on the side of the tank or on a gauge post placed in the tank.

| Depth. |                 | Gallons. | Depth. |                  | Gallons. |
|--------|-----------------|----------|--------|------------------|----------|
| Feet.  | Inches.         |          | Feet.  | Inches.          |          |
| 0      | 0               | 0        | 3      | 11               | 1,400    |
| 0      | 5               | 100      | 4      | 1 $\frac{1}{2}$  | 1,500    |
| 0      | 9 $\frac{1}{2}$ | 200      | 4      | 4                | 1,600    |
| 1      | 1 $\frac{1}{2}$ | 300      | 4      | 6 $\frac{1}{2}$  | 1,700    |
| 1      | 5 $\frac{1}{2}$ | 400      | 4      | 8 $\frac{1}{2}$  | 1,800    |
| 1      | 9               | 500      | 4      | 10 $\frac{1}{2}$ | 1,900    |
| 2      | 0 $\frac{1}{2}$ | 600      | 5      | 0 $\frac{1}{2}$  | 2,000    |
| 2      | 4               | 700      | 5      | 2 $\frac{1}{2}$  | 2,100    |
| 2      | 7               | 800      | 5      | 4 $\frac{1}{2}$  | 2,200    |
| 2      | 10              | 900      | 5      | 6 $\frac{1}{2}$  | 2,300    |
| 3      | 1               | 1,000    | 5      | 8 $\frac{1}{2}$  | 2,400    |
| 3      | 3 $\frac{1}{2}$ | 1,100    | 5      | 10 $\frac{1}{2}$ | 2,500    |
| 3      | 6               | 1,200    | 6      | 0                | 2,600    |
| 3      | 8 $\frac{1}{2}$ | 1,300    |        |                  |          |

*Hints on Dipping.*—As one of the proprietary dips is now generally used instead of the arsenite of soda or Natal Laboratory dip, it is only necessary to state that full instructions are supplied with each tin, and these should be rigorously adhered to.

In order to successfully accomplish the object for which the process is practised, viz., the destruction of ticks, it is essential that the fluid be maintained at the proper strength. If it falls below this, ticks are not destroyed, and so much time and money are wasted; if it becomes too strong much injury may be caused to the animals dipped, and in some cases serious mortality may ensue.

The strength of the fluid is altered by evaporation or by addition of water. It is pure water only which evaporates, and evaporation, therefore, results in an increase of the strength of the remaining fluid. The addition of rain and flood water naturally causes a diminution in the strength of the fluid. If the following procedure is faithfully adhered to, the strength of the fluid will be maintained at, or sufficiently near for practical purposes, the proper strength. After each dipping the depth of the fluid in the tank should be accurately measured, and the result recorded in a book specially kept for



the purpose; it is fatal to trust to memory in a matter of this sort, where the result may be so serious. Immediately before the next dipping the depth should again be measured, and any difference in the quantity of the fluid accurately calculated. If there has been a decrease, water alone to the extent of same should be added. If there has been an increase, dip should be added in proper quantity to make such increase equal in strength to that which is being used in the tank. On no account should this procedure be omitted even where the increase or decrease is small, because the repetition of such must result either in the fluid becoming so weak as to be useless, or so strong as to be injurious and even fatal.

Each animal that passes through the tank takes with it a quantity of the fluid, estimated at between half and one gallon; the level of the fluid in the tank is thus gradually lowered. To make up this deficiency, water with dip in the proper proportion must be added.

The chief reason for dipping is the destruction of ticks, which are transmitters of various diseases, amongst which in cattle may be mentioned African Coast Fever, Gallsickness and Redwater. It is, however, against the spread of Coast Fever infection by this agency that dipping is now so largely practised. But it has been found that the dipping of cattle has many other advantages. Apart from the disease-bearing capacities of ticks, it is evident that their presence on animals is a serious drawback, chiefly because of the large quantities of blood extracted, which should go to growth, or to improvement in condition, or to the increase of the milk supply. Not the least of the benefits of dipping is the reduction of the mortality amongst calves from white scour, liver disease, etc. Instances can be given where such mortality has been reduced from 60, 70 or even 80 per cent. to nil.

Apart from Coast Fever areas, where short intervals are necessary, dipping as a general measure should be practised every seven days. Fortnightly dipping, or dipping only when ticks are seen on the animals, is of very little value. This is evident when it is considered that our most dangerous ticks, *i.e.*, those which transmit Coast Fever, only remain on an average four days on the bovine host. In many cases animals which to the eye are apparently free from ticks will on close

examination be found to harbour large numbers of the larvæ and nymphal forms, especially in the ears, where some of the Coast Fever-bearing ticks are most commonly found. It should be remembered that the ticks most commonly seen are the engorging females, that the males are small, and on a beast with an average coat not easily seen. During the winter months, when ticks are comparatively inactive, the interval may be lengthened to 14 days, or dipping may be suspended altogether, but in the summer months, more especially the earlier ones, the shorter interval, even the three-day interval where there is a gross infestation, should be practised.

It is advisable to give working cattle a day's rest after immersion in the tank, but some farmers inspan them as soon as the skin is thoroughly dry. Where seven-day dipping is practised, the dipping can be carried out on the Saturday afternoon, thus giving the animal at least  $1\frac{1}{2}$  days to recover.

Opinions vary as to the effect of dipping on milch cows. Some assert that the quantity of milk is decreased to a large extent for 24 hours, and even longer, after dipping; others say that the effect in this respect is not appreciable. Assuming, however, that there is a slight immediate loss, it should be remembered that there is a general increase because of the better condition of the animals as the result of regular dipping.





Robey Steam Tractor ploughing on the farm of Mr. G. C. Woodforde,  
Lanteglos, Gatooma.



Robey Steam Tractor ploughing on the farm of Mr. G. C. Woodforde,  
Lanteglos, Gatooma.





## Ploughing with a Robey Steam Tractor at Lanteglos Farm.

By G. C. WOODFORDE.

The available ground for ploughing at Lanteglos Farm is all black vlei, and it being found difficult to plough this land profitably with oxen—a full span of oxen in winter ploughing only being able to work a single-furrow plough to a depth of from 5 in. to 6 in.—early this year it was decided to try ploughing with a Robey steam tractor. This was specially built by the makers for the work. The total weight of the tractor loaded is  $5\frac{1}{2}$  tons; the engine is compound, high-pressure cylinder 5 in. diameter, low-pressure cylinder  $8\frac{1}{4}$  in. diameter, stroke 9 in., revolutions per minute 330, boiler pressure 200 lbs. per square inch. A start was made in June, the ploughs used being a two and three furrow Columbia Gang on the very toughest ground, and Howard's B.Z.'s in the somewhat lighter soil. Both ploughs did excellent work; the depth of ploughing was from 8 in. to 10 in. and over.

At the commencement it was found that the steering gear on the engine was placed on the land side, which made steering somewhat difficult. The writer, therefore, altered the steering gear and built a steering platform on the opposite side, outside the cab of the engine. A furrow marker was also hung from the front wheel of the tractor, thus enabling a raw native, after a little practice, to steer with ease. The writer understands that the makers are now placing the steering gear of their new engines on the plough side. The fuel used was coal, supplemented with dry wood, the quantity of coal used being three to four bags per day of nine hours. The area ploughed was four to five acres per day, but it must be remembered that this was on exceptionally difficult ground and the engine only pulled five furrows.

A summary of the actual working costs may be of interest—

Native labour:—

|  | Cost per month. |
|--|-----------------|
| One engine boy ... ..  | 40/-            |
| One steering boy ... ..  | 30/-            |
| One plough boy ... ..  | 20/-            |
| Two boys with Scotch cart and<br>water tank at 30/- and 20/- ... | 50/-            |
| One boy cutting dry wood ... ..                                  | 15/-            |
| Total, £7 15s.   |                 |

Other costs:—

|  |         |
|--|---------|
| Coal, 8 tons at 30/- per ton ...                   | £12 0 0 |
| Oils, packing, etc., say, 30/- per<br>month ... .. | 1 10 0  |

Which makes a total monthly working cost of £21 5s.

This cost against, say, 80 acres ploughed per month would mean 5s. 6d. per acre. The writer attended to the work himself, and has not charged this against the working cost, but assuming that a European was employed at a contract price of, say, 5s. per acre, the total cost per acre would then be 10s. 6d. Regarding the cost of repairs, a very fair charge would be £15 to £20 per annum, and to allow for depreciation, 10 to 15 per cent. should also be written off the cost of the engine and ploughs at the end of the year. This would not, on most farms, be all charged against ploughing, as the tractor would do much other work. The writer, before ploughing, cut 180 tons of silage with a No. 11 Ohio cutter and blower.

Even on a farm where a very limited amount of ploughing is done, a tractor of this description is invaluable as a labour saver, and would soon pay for its first cost. In lighter soils, where disc ploughing is done, a much larger acreage could be done per month for the same cost as above. Every year in Rhodesia labour not only gets more unprocurable, but more expensive, and it is, I consider, to these modern labour-saving devices that the progressive farmer must look for salvation.



## Bright Virginia Tobacco Soils.

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By G. N. BLACKSHAW, B.Sc., F.C.S.,  
Government Agricultural Chemist.

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Although the production of bright Virginia tobacco on a commercial scale was not undertaken by the Rhodesian farmer until comparatively recent times, the industry has already made such important strides as to justify the inclusion of tobacco among the more important farm crops of this territory. With the increase in output year by year, it has to be admitted, as a natural consequence, that the quantity of lower grade leaf on the market has considerably increased, but the fact nevertheless remains that we can, with careful management, produce in this country a bright tobacco which is eagerly sought after by the tobacco manufacturers of South Africa, and which, in regard to colour and quality, offers good prospects for competition in the world's markets.

It is not within the scope of this article to discuss the gradual fall that has taken place in the prices realised on the public auction; suffice it here to say that one of the factors which has, in the opinion of the writer, led to the production of a quantity of low-grade leaf, has been the highly remunerative prices obtained in the early stages of the industry. When prices are good there is a disposition to over-crop, resulting in the production of leaf of inferior quality for want of care, and in many cases owing also to insufficient curing barn accommodation. A decline in prices, on the other hand, means that growers will be content to crop a smaller acreage, and will in consequence be able to give the leaf more careful attention, thereby producing a better grade and realising better prices.

The fact having been established that we can produce a bright leaf of very good quality, it will be interesting to make

a comparison of the soil types now used in this territory with the bright tobacco soils of Virginia and North Carolina, but before doing so it may be well to briefly consider the general character of soils which have proved, by experience, to be most suited for the production of this class of tobacco.

In selecting land for the production of bright tobacco, an experienced grower invariably avoids the heavier types of soil, well knowing that an attempt to grow bright Virginia leaf on such land is bound to end in failure. In deciding upon the suitability of a particular soil, he is, therefore, influenced more by its mechanical condition, or the proportion of sand to clay, rather than by the actual supply of plant food which it contains.

Long experience has established the dictum that the soil must be of a light sandy character, with a good natural drainage, if bright leaf of high quality is the aim of the grower.

In regard to the important question of colour, one of the most exacting tests for a bright tobacco is its power to withstand the great pressure to which it is subjected by the manufacturers without darkening, and if we are to be guided by American experience, the poorer the soil upon which the tobacco is grown, the better will the leaf bear this test. For the production of a "fast" yellow leaf then, a loose, quick soil, with an open sub-soil and protection from the prevailing winds, is required.

For particulars regarding the types of soil used for the production of bright tobacco in Virginia and North Carolina, I am indebted to Mr. W. W. Garner, of the Bureau of Plant Industry, U.S. Department of Agriculture, Washington, D.C., who has supplied me with the mechanical composition of four typical soils in the bright, flue-cured districts of those States. These particulars, together with the mechanical composition of Rhodesian bright tobacco soils, are given in the following tables.

BRIGHT TOBACCO LAND.  
VIRGINIA AND NORTH CAROLINA DISTRICTS.

| Locality                          | Description and Depth | Fine Gravel<br>1-2 m.m. | Coarse Sand<br>'25-1 m.m. | Fine Sand<br>'05-25 m.m. | Silt<br>'01-05 m.m. | Fine Silt and<br>Clay<br>under '01 m.m. | Water and<br>Organic Matter |
|-----------------------------------|-----------------------|-------------------------|---------------------------|--------------------------|---------------------|---|-----------------------------|
| Oxford, N.C. ...                  | Soil                  | %<br>2·56               | %<br>33·52                | %<br>42·35               | %<br>13·51          | %<br>6·49                               | %<br>1·68                   |
| Pitt County, N.C.                 | Soil                  | 0·00                    | 9·85                      | 71·50                    | 10·44               | 5·88                                    | 2·54                        |
| Danville, Va. (near)              | 6—30 in.              | 7·84                    | 21·51                     | 43·61                    | 12·96               | 10·53                                   | 3·49                        |
| Boydton, Va. (nine<br>miles east) | 6—12 in.              | 1·90                    | 29·87                     | 43·32                    | 9·95                | 13·08                                   | 2·45                        |

RHODESIAN BRIGHT TOBACCO LAND.  
*A.—Granite Soils.*

| Locality        | Coarse Gravel<br>over 3 m.m. | Fine Gravel<br>1-3 m.m. | Coarse Sand<br>'2-1 m.m. | Fine Sand<br>'04-2 m.m. | Silt<br>'01-04 m.m. | Fine Silt and<br>Clay<br>(by difference)<br>under '01 m.m. | Water and<br>Organic Matter | Calcium<br>Carbonate |
|-----------------|------------------------------|-------------------------|--------------------------|-------------------------|---------------------|--|-----------------------------|----------------------|
| Marandellas ... | %<br>†0·22<br>‡0·20          | %<br>21·01<br>22·04     | %<br>50·53<br>45·63      | %<br>15·22<br>14·68     | %<br>4·57<br>4·42   | %<br>6·31<br>10·49   | %<br>2·14<br>2·54           | %<br>...<br>...      |
| Umtali ...      | †0·87<br>‡1·42               | 11·09<br>11·51          | 44·68<br>35·67           | 24·65<br>26·04          | 8·43<br>9·66        | 6·66<br>9·23   | 3·61<br>6·45                | 0·01<br>0·02         |
| Umtali ...      | †0·72<br>‡0·63               | 9·74<br>9·38            | 42·81<br>41·76           | 31·17<br>25·96          | 6·95<br>9·72        | 5·81<br>9·26   | 2·80<br>3·29                | ...<br>...           |
| Salisbury ...   | †0·30<br>‡6·05               | 3·65<br>3·61            | 40·90<br>34·87           | 34·20<br>32·46          | 9·13<br>7·58        | 7·67<br>10·83  | 4·13<br>4·57                | 0·02<br>0·03         |

*B.—Sandstone Soils.*

|              |                |              |                |                |              |              |              |              |
|--------------|----------------|--------------|----------------|----------------|--------------|--------------|--------------|--------------|
| Bulawayo ... | †0·00<br>‡0·00 | 0·61<br>0·06 | 22·97<br>24·83 | 69·51<br>67·98 | 1·00<br>0·82 | 4·06<br>4·74 | 1·83<br>1·55 | 0·02<br>0·02 |
| Nyamandhlovu | †0·00<br>‡0·00 | 0·08<br>0·09 | 41·80<br>46·82 | 43·90<br>42·12 | 1·66<br>1·18 | 6·80<br>7·37 | 2·75<br>2·41 | 0·01<br>0·01 |
| Pasipas ...  | †0·00<br>‡0·00 | 0·03<br>0·08 | 16·88<br>18·21 | 76·85<br>74·74 | 0·77<br>0·81 | 4·03<br>4·88 | 1·42<br>1·25 | 0·02<br>0·03 |
| Pasipas ...  | †0·00<br>‡0·00 | 0·49<br>0·56 | 35·82<br>33·65 | 55·47<br>56·80 | 0·95<br>1·24 | 5·29<br>5·89 | 1·98<br>1·86 | ...<br>...   |

† First nine inches from surface.

‡ Second nine inches from surface.



Although the depths from which the samples were drawn and the range of size adopted for coarse and fine sands, etc., are not exactly the same for the Rhodesian and American analyses, it is clearly evident that the Rhodesian granite soils, of which the composition is given in the above table, are, broadly speaking, coarser in character and contain a lower proportion of silt and clay. The Rhodesian sandstone soils contain a still smaller proportion of silt and clay, and are of a more sandy nature than the typical bright tobacco soils of Virginia and North Carolina.

We are led to conclude, therefore, that the Rhodesian bright tobacco soils are somewhat lighter than those of America. This is not, however, to be considered a disadvantage, for, as was mentioned earlier in the article, yellow leaf produced on the poorer soils will, according to American experience, not so readily darken under pressure, and this is regarded to a great extent as a test of merit.

## Winter Cropping of Moist Vlei Soils.

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By W. J. BLACKLOCK HARRIS, Infiningwe, Insiza.

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The object of these few notes is more for the benefit of new settlers than old, and it is hoped they will be accepted in the spirit in which they are written. The notes refer to granite country only, which is considered to be the poorest of our soils, and in which parts of the country many of our new settlers are located.

A wet vlei is usually a low-lying piece of ground—a shallow valley—into which most of the summer rainfall, absorbed by the surrounding ridges and slopes, percolates during the winter months. There is other wet land, “m’senya” as it is termed, sometimes found high up on the ridges, which is due in most cases to an intrusion of some impervious rock, running near the surface and parallel with the ridges. This intrusion, or “bar,” prevents the percolation of water to the lower levels, and the water, therefore, rises to the surface, up the face of the intrusion. These soils vary in colour and quality, from light grey sandy loam to a black turf.

My experience has been that at the foot of long slopes, or the base of kopjes, is the best place to look for such land; and the darker the soil, on account of its humus content, the better for our purpose. If, when located, the ground appears dry—even in summer—do not abandon it, but immediately after the first good soaking rain get the plough going as deep as you can and break the crust. I have known this crust, usually composed of black sandy soil and humus, to be anything from 8 inches to 1 foot in thickness and very hard; so hard, in fact, that only after a good rain will the plough penetrate. After ploughing, a good disc harrow is most useful in breaking up the long slab-shaped clods. Keep on working at it every

opportunity, and do not attempt to replough until the clods shew signs of rotting. The following summer season put some cultivated crop in—maize for preference—and cultivate well; after reaping, plough deep and well again, and work land to as fine a tilth as possible, when, if the clods have disappeared and the land is in a good state of tilth, and having been well cultivated during the summer to prevent evaporation, it will be found to be quite moist, just below the mulch or dust blanket.

Enough moisture has been saved to start the winter crop, and the moisture percolating down from the ridges during the dry months will be arrested in the reservoir made by cultivating the vleis, and used by the growing crops. The above-mentioned is an extreme case, but there are no doubt thousands of acres of the same soil in the granite country neglected through lack of knowledge. On the other hand, the wet vleis being worked to-day are actually wet on the surface, but are no more than perhaps two or three acres in extent; a little prospecting will soon discover them. These latter vleis, however, are usually much poorer—varying from a light to a dark grey in colour—than the first-mentioned, and are usually caused by some intrusion of rock, as stated previously.

When once the land is in good tilth, I always summer-fallow the heavy soils, or take a catch crop of beans off them; the lighter soils I am in the habit of manuring with kraal manure and harrowing as opportunity offers during the summer. Don't worry about weeds; this is just what is required. About the beginning of February, when the weeds are in full bloom and have made as much growth as possible, plough them in deep, and keep the land cultivated and mulched until planting time. The weeds I find most efficacious in adding to the store of humus in the lighter soils, and thus preventing evaporation. The land is now ready for winter planting.

I have found that Gluyas Early wheat does the best with me, and yields about four to six bags per acre, dependent upon soil, sown between the middle and end of April, broadcast, at the rate of 60 lbs. per acre. I usually cover the seed in with the disc harrow as deep as possible, and then run over it once or twice with a tooth harrow. Harvesting usually takes place during September.



Barley is treated the same as wheat, only this is usually used as a green feed during winter.

Potatoes are usually planted in soil well manured the previous summer, in rows 3 ft. x 2 ft., during the latter part of July. As a crop to catch the good prices, French Early Rose is recommended, and may be lifted at end of October. Up-to-date is also good, but a few weeks later.

Onions I usually drill in with an iron age garden seeder, in February, in rows 12 in. apart, 5 lbs. of seed to the acre, on well-manured soil, and am careful to reserve another good piece of land, also prepared for onions, so that I shall have a place to put my "thinnings out." I find this method less expensive, and also that the onions drilled in and allowed to grow where they were first planted mature much earlier than the transplants. Keep rows well cultivated during growth; an iron age hand cultivator, or similar implement, for straddling the rows and doing two rows at a time, is a most economical tool, and can be worked by one boy. Lifting the crop usually takes place about the beginning of August. A few remarks about the best variety of onion seed to grow may be useful to beginners. Since residing on this farm I have experimented with 11 different varieties of seed, and have discarded them all with the exception of one—the White Bermuda. This variety is identical with the Natal Red, the favourite variety, only my experience proves that it matures earlier and has a much thinner neck; a big consideration when one goes in for dried onions, while the price is only 7s. per lb. as against 30s. for Natal Red seed. I may also add that the seed is imported direct from Teneriffe, and the growers' description as below is correct:—

"White Bermuda.—Though called white, this is not in reality a white onion, but of a light straw colour, of large size, mild flavour, very prolific, early, broad and flat in form, fresh, crisp and solid. Plants are extremely thin necked, ensuring an early and even ripening." They are extremely good keepers.

Onions are such a profitable crop, in winter, to the agriculturist, that I may be excused for writing at such length on the subject. Wet vleï farming I may say, in conclusion, is to

my mind only a modified form of "dry farming," although not quite so laborious as the latter; but still, to get good results from the soil, one must put good work into it. Then, again, there are very few farms where one can plough from one end to the other, as it were, and make something more than a living out of summer crops.

Agriculture alone, on the average granite farm, with only a summer crop to look forward to is, to my mind, an unpayable proposition. Irrigation, too, is expensive, and the majority of farms not always suitable for it. It is, therefore, by looking to our wet vleis that we shall be able to raise two crops—summer and winter—per year, and to make something more than a living out of agriculture alone.

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## South African Garden Practice.

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We have received from the Horticultural Publishing Co., Johannesburg, a valuable booklet bearing the above title, compiled by Mr. E. W. Griffiths, editor of *South African Gardening*. The publication indicates in a very comprehensive manner the various operations and sowings of seed which can be made at different times of the year, and while in certain cases some allowance will have to be made for difference in the climatic conditions obtaining here and in the Union, the booklet will be found a very useful guide to the amateur gardener in Rhodesia. The Central News Agency are the publishers, and the price of the book is 2s.

# New Crops for Rhodesia.

## RESULTS OF EXPERIMENTS.

By J. A. T. WALTERS, B.A., Assistant Agriculturist.

**DHAL** (*Cajanus indicus*).—This crop, which did so well last season at the Botanical Experiment Station, has been harvested since the last notice appeared in this Journal. A method of harvesting was adopted which made the work very simple. The whole plants were cut about a foot from the ground, and allowed to dry on a sail in the open. After two or three days the plant was taken by the stem and beaten on the ground; the beans fell out easily, leaving the empty pods on the plant. Very little winnowing is required to make the sample clean.

The crop is a perennial, and in one plot where the plants were cut for harvesting on the 1st July, the stumps remaining in the ground had made up to two feet new growth by the first week of November. In another plot, where the plants were allowed to stand without being cut down, it was observed that the foliage remained green through the winter. The late flowers, however, were cut off by the frost.

**BUCKWHEAT**.—The results obtained from the variety trials were as follows:—

|                      |                     |
|----------------------|---------------------|
| Common ... ..        | 2,048 lbs. per acre |
| Tartarian ... ..     | 1,080 „ „ „         |
| Silver hulled ... .. | 852 „ „ „           |

The common variety has consistently given the best results, and the above yield may be considered distinctly good, as the crop is a comparatively easy one to handle.

**LINSEED**.—The Russian varieties (Pskoff and Riga) have again given poorer yields than the improved varieties. One of the best features of the White flowering and Yellow seeded varieties is that they ripen fairly evenly. Yields:—



|                        |                   |
|------------------------|-------------------|
| White flowering ... .. | 380 lbs. per acre |
| Yellow seeded ... ..   | 352 „ „ „         |
| Riga ... ..            | 328 „ „ „         |
| Pskoff ... ..          | 300 „ „ „         |

It was remarked in a previous article that the crop in its early stages was attacked by cutworms, which accounts for a yield somewhat on the small side; but, with prices ruling as at present, this valuable stock feed is well worth growing on a small scale on every farm.

**SOYBEANS.**—The extended variety trials of the last few years had reduced the more promising varieties to two—Southern and Sakura. These were grown this season, but, in spite of favourable weather conditions which produced good leaf growth, the best yield of seed was only 256 lbs. per acre.

**COWPEAS.**—This valuable crop is subject to the attacks of so many insect pests in Rhodesia that no yield comparable with those recorded in the United States has been obtained here. Of six varieties tried this season, two gave promising results. These were the Natal Black, which yielded at the rate of three bags per acre; and the New Era, with close on four bags per acre. A serious attempt is being made to place this crop in a sound position by means of selection and the introduction of new varieties.

**HYBRID WHEATS.**—Thirty-five strains of hybrid wheats, produced at the Botanical Experiment Station, were propagated this season. The object in almost every case has been to improve the milling and baking qualities of Victoria wheat. The season was extremely favourable to rust, and the most rust-resistant strains were easily separated for further selection and propagation. The photograph which appeared in the August number of the *Rhodesia Agricultural Journal* (page 878) shews how far improvement has been effected by hybridisation and selection.

**MANGELS.**—This crop was treated with kraal manure at the rate of 5 tons dung per acre, and the seed was sown on 16th December, 1912, in rows 2½ ft. apart. Four varieties were tried. The Half Sugar and the Mammoth Long Red varieties have consistently been the heaviest yielders, and shew a great improvement over the other varieties grown under similar conditions.

|                          |                    |
|--------------------------|--------------------|
| Mammoth Long Red ...     | 7.9 tons per acre  |
| Half Sugar Mangel ... .. | 7.2   ,,   ,,   ,, |
| Golden Tankard ... ..    | 4.6   ,,   ,,   ,, |
| Yellow Globe ... ..      | 3.8   ,,   ,,   ,, |

These crops were grown after wheat the previous year. It will be observed that the amount of kraal manure applied was small. The mangel crop is one that essentially needs heavy dressings of manure, and no heavy crops can otherwise be expected. At the Botanical Experiment Station in 1911, with a heavy dressing of kraal manure on second-year land, Half Sugar mangel gave  $21\frac{1}{4}$  tons per acre. As mangels have been realising £3 per ton, even the lighter yields quoted above make them a payable crop under present conditions. The growing of the mangel crop entails much care and attention. The farmer should endeavour to realise the heavier yields by the liberal application of manure, say, 8 to 10 tons per acre. This will also leave the land in excellent condition for the following year's crop.

**CASTOR BEANS.**—Two trials were conducted with Castor beans. In one case the crop was grown as an annual, planted in rows 4 ft. apart with 1 ft. between the plants. This allows of 10,000 plants per acre. The yield in this case was only 584 lbs. of beans off an acre. In the second trial the crop was sown as a perennial, the plants being spaced 8 ft. apart in each direction. This allows of 680 plants per acre, and the yield amounted to 800 lbs. per acre, or  $1\frac{1}{3}$  lbs. per plant. The harvesting proved a long and tedious business, as an attempt was made to lose as few beans as possible. The results obtained in such a favourable season as 1912-13 hardly justify recommending this crop as a profitable one under climatic conditions similar to those at Salisbury.

**MAIZE.**—An interesting demonstration of the value of rotation with this crop was afforded at the Botanical Experiment Station this season. Slightly under an acre of maize was planted on land that had been under various other crops for five years. Last year on this piece of ground pea-nuts and oats were planted. No manure has been applied at any time, and no special attention given to the crop: the seed used was that selected from our experiment farms. The soil is the usual red soil prevailing around Salisbury. The yield obtained this season was  $16\frac{1}{4}$  bags of grain off nine-tenths of an acre, making an equivalent of 18 bags per acre.

## Feeding and Care of Imported Cattle.

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By R. C. SIMMONS.

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Notwithstanding any appearance of hardiness at the time of the animal's arrival on the farm, and whether or not it has been inoculated, it is wise to assume that for the first season the beast will not be able to withstand ordinary Rhodesian conditions; with the exception, of course, that the class of food required is somewhat different, the treatment such an animal requires is much the same as that which one would give to a good horse, with regular dipping in addition. By these means the animal is enabled to thoroughly recover from the effects of change of climate and other experiences incidental to importation from the South or from overseas. The beast will gradually become accustomed to discriminate between the good and bad amongst the strange herbage and foodstuffs at its disposal, and should it contract redwater or gall-sickness, it will be in a strong, healthy condition to combat the disease, and is, therefore, infinitely more likely to recover than would be the case had it been made to lead an existence uncongenial to its nature. By the second season the majority of animals so treated have in the past acquired an ability to withstand approximately natural conditions. At the same time it should be remembered that, in order to obtain the fullest measure of profit from a good imported stud beast, especially a bull, it should never at any time of its life be allowed to lose its condition, and should always, except possibly when the veld is at its best, receive some additional or artificially prepared food.

It is not necessary to pamper imported cattle, but they do require shelter from cold or driving rains and excessive heat, and should not be expected to walk long distances until they are fully acclimatised. Shelter is usually afforded by an



ordinary lean-to shed with a sound roof, and so placed as to shield the animal from the prevailing wind. An ordinary well-ventilated horse stable is very suitable also, should such a building be available.

An ideal system of management of a bull on a stud or dairy farm would be to feed the bull entirely in the stable, and lead him for exercise on the road (free from grass and, therefore, ticks) for two or three hours night and morning, bringing him to such cows as require him. A modification of this system would be a small shed in a camp or paddock, in which the bull could roam at will, and in which he could be conveniently fed and watered. A few in-calf and dry cows could be left with him for company, and cows requiring his services could be brought to him. This camp system is especially useful for heifers until they are well acclimatised. A system which will perhaps be found more convenient at the present time in the case of bulls is to feed them night and morning in a shed. Allow the animals to lie in the shade near the homestead all day, and, in the case of a bull, put him in the kraal with the cows at night. In choosing either of these systems, it should be borne in mind that the system which best enables one to keep the animal tick-free (especially if it has not been inoculated) will probably be the cheapest in the end.

Animals should be thoroughly dipped once a week at least. In addition to this, the ears and parts under the tail should be swabbed with some dip whenever ticks are seen adhering. Grooming and every other reasonable means should also be employed to keep them clean and tick-free. The stall, manger, bedding, etc., should be kept clean and fresh.

If animals are led to exercise, let it be on the clean, hard road free from ticks. If turned out to roam at will in winter, let it be on dry, short pasture, not on green vleis or early burns. If they get no green food outside, they will eat all the better in the stall. In summer the green food obtained outside is nourishing, and if, while exercising, the animals can also be feeding, so much the better.

Feed three times a day if all food is given in the stall, and twice a day, night and morning, if the animal is allowed to graze. Dry heifers, as a rule, will require to be kept in good, healthy active condition only, and should thrive on hay, roots, pumpkins, ensilage, and a little mealie meal and bean meal. A good ration for a dry two-year-old heifer would be somewhat as follows:—

|                                      |        |
|--------------------------------------|--------|
| Ensilage or other succulent food ... | 25 lb. |
| Hay ... ..                           | 10 lb. |
| Mealie Meal ... ..                   | 4 lb.  |
| Bean Meal or Ground Nut Meal ...     | 1 lb.  |

A bull or a cow in milk requires rather better fare, and a full-grown animal of either sex requires food somewhat as follows:—

|   |        |
|---|--------|
| Succulent Food, such as green<br>mealie stalks, pumpkins, roots<br>or ensilage ... .. | 40 lb. |
| Mealie Meal ... ..  | 5 lb.  |
| Bean Meal ... ..  | 2 lb.  |
| Buckwheat Meal, or Linseed, or<br>Sunflower Seed, or Ground Nut<br>Meal ... ..        | 1 lb.  |
| Hay ... ..  | 10 lb. |
| (or all the beast will consume.)  |        |

If oat hay is fed, some of the hay and the buckwheat or bean meal may be omitted. If the animal grazes at all, reduce the succulent ration accordingly. Towards the end of summer, when the grass is very nutritious, the animal may do without the bean meal. This is merely a sample ration to indicate about what quantities are required. Any detailed information may be obtained on application to the Director of Agriculture, Salisbury.

It is well to remember when feeding imported animals—

- (1) to give feed at regular hours, and in such quantities as will be cleared up at one meal;
- (2) that they require a larger proportion of succulent food than native cattle;

- 
- (3) that they should be fit and vigorous, not soft and fat;
  - (4) that great cleanliness should be observed in feeding;
  - (5) to provide variety in the feed where possible;
  - (6) to feed in the form that the individual animal likes best, and get the beast on its feed by feeding small quantities at first;
  - (7) that all changes in food should be made gradually;
  - (8) that clean water should be available at all times;
  - (9) that salt, either in the form of a brine sprinkled over dry fodder or as a lick, should be provided.

A young bull should be used sparingly during his first season, and not more than 25 cows should be allowed if possible. Do not allow the bull to run with the cows when other local bulls are in the same herd. Do not allow the bull to work in the heat of the day.



## Citrus Fruits in Rhodesia.

### SUGGESTIONS AS TO WHERE TO PLANT.

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By C. E. FARMER, Citrus Adviser to the B.S.A. Company.

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In selecting a piece of land on which to plant a grove of citrus fruits, whether it is to be one of small or large dimensions, it is well to bear in mind that the location is being chosen for the planting of trees which, given congenial soil and climatic conditions, do not reach their full size and bearing capacity for many years, and which, after they have attained it, continue to thrive and bear crops almost indefinitely. Before making a selection, especially on farms that are new, consider as far as it is possible under present conditions, where permanent roads will be required, and convenience to the future homestead, and to the probable site for a building in which to pack the fruit for market. These fruits will grow well on a variety of soils; no particular kind of soil is absolutely necessary, but some particular conditions of soil are essential. Of these I will place first—

**DRAINAGE.**—The soil should be a thoroughly drained one, either naturally or artificially. In Rhodesia I do not think it is necessary to resort to the latter course; there is plenty of naturally drained land, and the former is better, lasts longer, and costs nothing. Not only should the surface water be able to get away, but the drainage should be such that the tree roots, and especially the tap-root, should be able to penetrate as deeply as possible. They will not penetrate beyond the depth at which wet soil or standing water is met, and this should not be at least within 10 ft. of the surface. In this climate of such marked dry and wet seasons, what may appear to be dry and well-drained land at one time of the year may be a bog at another. There is another reason why the soil should be well

drained and sweet. Although it is true that citrus fruit trees are surface feeders, and that at a depth of a few inches the soil will be found full of fibrous roots, yet by examination of the root system of trees in deep, well-drained soil, which is not at the same time too close and compact, it will be found that lateral roots start away in all directions, and the space of the feeding ground from which the tree can draw nourishment is increased. For instance, if land is drained to the depth of one foot only and trees stand 24 ft. apart, each tree has 24 ft. x 24 ft., or 576 cubic feet of soil from which to draw its food. But if the soil is of a nature to allow the lateral roots to penetrate to a depth of 5 ft., the tree has five times the space or 2,880 cubic feet of soil from which to draw its food. It must be allowed, of course, that the nearer the surface the greater the fertility of the soil, but this deeper feeding ground is still of great benefit to the tree, and minimises the waste of soluble manures from leaching. Also in shallow-drained soils the greater the danger in exceptionally wet seasons of injury to the root system from the rising of acids from sour sub-soils. Next and very closely connected with drainage is—

DEPTH OF SOIL.—If the soil is deep, it will drain the surplus moisture from the surface into the sub-soil. Not necessarily depth of fertility also, though so much the better if this can be had too; but there should be depth of soil which is near enough akin to the surface soil that no great radical change occurs suddenly to destroy the capillarity of the soil, such as a sandy or loam top soil, and then a change to gravel or impervious clay. On this depth of soil depends success, without artificial irrigation, of bringing trees through the dry season, carrying their crop of fruit set from the August and early September blossom, which is the fruit of best quality and which ripens in time for European markets when those markets are bare of citrus fruits from other countries. Consider your particular piece of land as a storehouse for moisture. The deeper the soil the greater its capacity for taking in and storing up a surplus supply during the rainy season, without losing it altogether by underflow or without remaining too wet on the surface. This supply is held in reserve and given back to the trees as it rises from below by capillary attraction during the period of drought. If the soil is shallow, with gravel sub-soil, this surplus moisture is



drained away and lost by underflow through the gravel. It is not returned to the surface, and the only supply available during the months of dry weather is that actually retained in the surface soil, which will be exhausted more or less quickly according to its depth and the age and size of the trees it supports.

**NATURE OF THE SOIL.**—As regards the red and brown loam soils, there is little to be said under this head. Whether they are stiff loams or light and inclined to be sandy, they usually contain a fair depth of surface soil with a high degree of humus and fertility, gradually changing to clayey sub-soils of the same nature, very retentive of moisture and not stiff enough to hold up the natural drainage from the surface or prevent the penetration of the root system. Gravel at or near the surface is their worst feature, and is often found to be present, especially in the red soils. A brown loamy surface soil, shallow in depth and underlaid with a yellow, clayey sub-soil, and often containing gravel, is sometimes met with. This sub-soil seems uncongenial to the citrus fruit tree, making this particular class of brown soil one not to be recommended for the growing of these fruits on commercial lines. The granite or sand lands need closer examination. Some are so fine that the surface works up in dry weather into a powder, which is carried away by the wind in clouds as a farm implement goes through it, and in wet weather lies so close and compact that the air cannot penetrate it. Soils of this fine grain and close compact nature are not suitable; they are not porous enough to admit the free circulation of air which the fibrous roots require, and which is also required to keep up the warmth and fertility of the soil. Others are so coarse in the grain as to contain a certain amount of very fine gravel, which destroys its power to retain moisture or to draw it from the sub-soil below. These are to be avoided. Select, if possible, a medium-grained grey granite sand, with clayey red sub-soil, or deep yellow sand sub-soil, free of gravel. Vlei land is unsuitable, being close and compact, cold, shallow, badly drained and usually the sub-soils are sour, hard and impervious. Alluvial soils are excellent, the conditions of depth and drainage being good; but they must not be situated so low as to attract frost to a dangerous degree. Decomposed sandstone lands having the same qualifications are also excellent.



**SLOPE.**—Cultivation plays an important part in the production of good fruit. The surface of the grove should be loose from frequent cultivations during the dry season. When the rains set in the danger of this loose top-soil washing to the bottom during heavy torrential downpours is in proportion to the degree of the slope of the particular piece of land under consideration. Also the greater the slope the more slowly the land will absorb and store away moisture, resulting in a greater loss of the annual rainfall by “run off” to the nearest water-course. Land steep enough to be subject to these disadvantages should if possible be avoided.

**FROST.**—It is necessary to see that the site is favourably situated as regards frost. In semi-tropical climates, frost is very eccentric in its movements. It is patchy, striking one point and missing another close by. Currents of cold air, like water, drain to the lowest spots. As they flow along and meet obstacles, they pass over or round them, forming eddies which decrease in their circular motion as the distance increases from the main current, leaving some spots untouched and others with their delicate vegetation frosted and killed. If the intended site lies so low as compared with the country immediately surrounding it as to attract the main currents of frosted air to a dangerous degree, it may be wise before planting trees upon it to hang a thermometer near the ground and observe the temperatures daily through a cool season. It may be laid down as a general rule that orange and lemon trees should not be planted where the temperature drops below 26 deg. F. of continued cold; that is, for the greater period of the time between sunrise and sunset, but a temperature of 24 deg. F. for two or three hours will not usually damage a dormant tree. The dry conditions of the Rhodesian atmosphere through the cool season would probably permit a still lower temperature to prevail for a short time without material damage. Recently, planted trees in active growth were closely observed during the month of July, when the thermometer shewed at sunrise a temperature of 25 deg. F. on two mornings in succession and 24 deg. F. on the third morning. The ends of new sappy shoots on some trees only were nipped back for an inch or so. These trees were sheltered from the frost and from the early morning sun to some extent by a few mealie stalks placed round them and bunched together over

the top. It is unlikely, however, that the low temperature lasted for more than a short time before sunrise. The amount of damage inflicted on a citrus fruit tree by any given temperature depends entirely on the activity of or amount of sap flowing at the time in the tree, and on the conditions under which it thaws out.

While on this subject, a few facts connected with the heavy frosts which have occurred in the orange groves of Florida may be interesting. It is a matter of record that in January, 1886, the Florida orange groves passed through a spell of continued cold, with a temperature at times as low as 15 deg. F. The crop of fruit was lost and trees defoliated, but they escaped without material injury to the bearing wood. I believe this is the greatest amount of continued frost that orange trees have been known to survive without great injury, but their escape may be attributed very largely to the fact that from 20th December to 15th January citrus fruit trees in that State are dormant, the flow of sap having been checked by cool weather and light frosts from the middle of November, and also to the fact that as the cold passed, the sky remained cloudy while the weather resumed its normal temperature and the thaw came under favourable conditions. In December, 1894, a similar spell of cold weather was experienced, the temperature not falling below 18 deg. F. This was followed by bright sunshine, and the trees suffered more damage than in 1886, and with 3 deg. less frost. Even then the damage was not very great, except in young groves, and in six weeks' time the trees had put on fresh foliage and were out in blossom. However, on the night of 13th February the temperature again fell to 18 deg. F., and this coming at a time when the sap was flowing freely and the trees forced into unusual activity in order to renew the foliage lost during the previous cold weather, killed the trees of all ages throughout the State down to the ground level, the stumps and roots being all that was left uninjured to the Floridian with which to renew his groves. In the winter of 1899 portions of the citrus belt were again subjected to a temperature of 18 deg. F., and the trees grown since the killing frosts of December and February, 1894-5, were again killed to the ground level, although there was not a second severe frost that winter.



**WIND PROTECTION.**—I have written rather at length on the subject of frost, but from my observation of the Rhodesian climate and from information obtained during the year I have been in the country, the citrus fruit grower here has more cause to make provision against the prevailing winds than against frost, and fortunately for him he has the easier element to contend with. Not that he will find sufficient natural protection, but the planting of belts of forest trees to the south and south-east of the grove is a simple matter. A tall fast-growing tree is required, and if one can be found which will be useful at some future time for timber, so much the better. Choose a variety which is tall enough to lift the wind as far as possible, and plant enough of them to make an effective screen. These continual parching east winds rob the trees of moisture, cause them to lean and make the growth unsymmetrical. On high, exposed sites the trees are stunted and become unhealthy. In this condition they are more subject to attacks of the various scale insects, and these in their turn are more free from their natural enemies, which do not get in such effective work in a wind-swept grove. Wind, too, is the chief cause of fruit becoming “thorned,” scarred, bruised and rendered unfit for market. If it is suspected that the intended site is subject to frost, the shade from the high trees forming the shelter belt to the east will protect the trees from the early morning sun, allowing the frost to come out gradually without rupturing the cellular tissue, and thus reducing the damage to the frozen part. If in laying out the groves the lines are run due east and west as far as possible, the trees will to some extent in after years shelter each other from prevailing winds. It is, of course, next to impossible to afford shelter from tropical hurricanes.

**TRANSPORTATION.**—The citrus fruit grower should remember that his crop is a bulky one; and although the net profit of a very few shillings per box will mount up to a considerable sum per acre, it is an easy matter to spend that amount in the additional expense of attempting to haul fruit a great distance to the railway. The ultimate object of growing the fruit being to make a profit on it, it is necessary to consider what the cost of this particular item is going to be, and also what the facilities are for getting it to the railway quickly enough. A lower rate per box is usually given by railway companies for



carriage by the truck load, which would probably be from 180 to 200 boxes, or at least three loads. If the grove is a day's trek with oxen from the nearest station, it would take six days' continual work for one span to load the truck. The first load would have to wait in the truck on the siding for the others to be brought in, and the first consignment would have been packed six days before it commenced its journey to market. In some cases growers may be so situated as to be able to combine and load the requisite number of boxes in one day. The exact distance it is wise to grow fruit from a station must depend on the state of the particular roads, the opportunity of combining with neighbours in making shipments, and the cost to carry produce to the nearest railway point. All of these factors the intending grower should be in the best position to judge for himself.

IRRIGATION.—Given a deep soil, retentive of moisture, good shelter belts and not too much slope, a normal rainfall of 30 inches or thereabouts, citrus fruits should be grown successfully with careful attention to ploughing and cultivation without the artificial application of water. But it is not always possible to get these advantages in combination. If a site is available with good conditions of soil, and capable of being placed under irrigation, it would be preferable to one to which water cannot be brought, if only as a safeguard against the failure of the normal rainfall and other climatic conditions affecting the successful cultivation of fruit in this country not yet brought to light by actual experience.

# Rhodesian Citrus Fruit.

## EXPORTATIONS TO LONDON.

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By CHAS. E. FARMER, Citrus Adviser, B.S.A. Company.

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A consignment of oranges and lemons was this year sent to London from the Land Settlement Farm, Marandellas. Picking the fruit commenced on 23rd May, 1913; it was packed and ready for transport to Marandellas Station, a distance of 25 miles, on the 30th, and left Cape Town by the "Balmoral Castle" 18th June, arriving Southampton 5th July, being carried in the cool chamber of the vessel.

Oranges of six different varieties were packed together, there not being enough of one kind to keep the varieties separate. Three varieties of Navels, namely, Washingtons, Thompson's Improved and Navelencias, were separated and packed together, being labelled "Navels." The oranges were partly green and too unripe to have attained their full flavour, the object being to send the fruit to arrive in time for the English shows. The lemons were chiefly Lisbons, and were sent forward uncured.

A second consignment of oranges was sent from the Premier Estate, Umtali. These were taken from the trees during the first week of June, and left Cape Town on the 25th by the "Armada Castle," arriving at Southampton on 12th July, being also carried in the cool chamber. These, too, were Washington Navels, Thompson's Improved Navel and Navelencias, packed together and labelled "Navels." The fruit was rather riper and better coloured than that of the first consignment, but had not fully matured.

The boxes used were of the standard size, and obtained in South Africa, made of Wattle wood, unsightly in appearance and unfit for the export trade.

Thirty-five boxes of the first consignment were submitted to the South Africa Constantia Fruit Co., of 6, Wandsworth Road, Vauxhall, London, for examination. They report as follows:—

“Our opinion on the quality of the fruit generally is that there is good material for the production of an orange equal to anything which has yet been brought to these markets. Most of the fruit was a poor colour, due to being packed too green, so that one could not judge the flavour too harshly, but the riper and better coloured fruit tasted were sweet and juicy, and had silky, thin skins. . . . It was quite exceptional to find only a matter of two dozen decayed oranges in the entire lot. We handle large quantities of South African oranges every season, and always look upon 5 to 10 per cent. of waste as an ordinary average.”

The same Company also examined the second consignment, and state in their report as follows:—

“The fruit was on the whole a better colour, and all those cut were found to be juicy and sweet, and, in our opinion, they are a credit to Rhodesia or any other country. . . . One case appeared to have been damaged, and we found some decayed fruits in one side of the box, no doubt due to the fragile nature of the package, but the remainder of the parcel was in perfectly sound order.”

The consignments were also examined by Messrs. Parsons & Co., of Covent Garden Market, London. After referring to the unripeness of the first lot, they go on to state:—

“We were pleased to note that the second arrival was in excellent condition, and really quite as good a Navel orange as we have ever seen. There is no doubt that if Rhodesia can put oranges of this quality on the English market there will be a great future for the trade.”

With reference to the lemons, the South Africa Constantia Fruit Co. say:—



“In going through the lemons, we found many of the fruits with rough skins, also some with blemishes, but, taking them as a whole, we should say that they compare favourably with any other lemon that comes to this market. They coloured up very well, and the greater portion of them had nice clean, thin skins. But there is little hope of building up an export trade in them, as they are worth much more in the South African markets, and will be for some years to come.”

The fruit not used for show and exhibition purposes was sold in the open market by the South Africa Constantia Fruit Co. The highest price realised was £1 5s. per box of the 96, 126 and 150 packs, and the lowest price was £1 for the 176 and 200 packs. The lemons realised 5s. 6d. per box only, the packs running 200's and 250's.

Taking into consideration the following facts:—

- (1) that the fruit, and especially that comprising the first consignment, was picked before maturity, and sent on its merits without close culling;
- (2) that it consisted of a number of varieties packed together, necessitating placing in the same box round and oblong fruit, thereby giving the appearance of bad grading and packing;
- (3) that the lemons were uncured;
- (4) that the boxes were of poor material and unsightly;
- (5) that the fruit was grown with little cultivation, without the use of fertilisers of any kind, and without irrigation;

the opinions expressed in the above reports, together with the prices realised for the oranges sold, are very satisfactory; and speak well for the quality and carrying power of citrus fruits grown in Rhodesia, when that attention to detail of cultivation and manuring is given them which they receive in those countries where the growing of them is a recognised commercial industry.

The railway and shipping companies have been asked to quote through rates to London, and as soon as quotations are received the figures will be available for the information of growers.

## Weather Forecasting.

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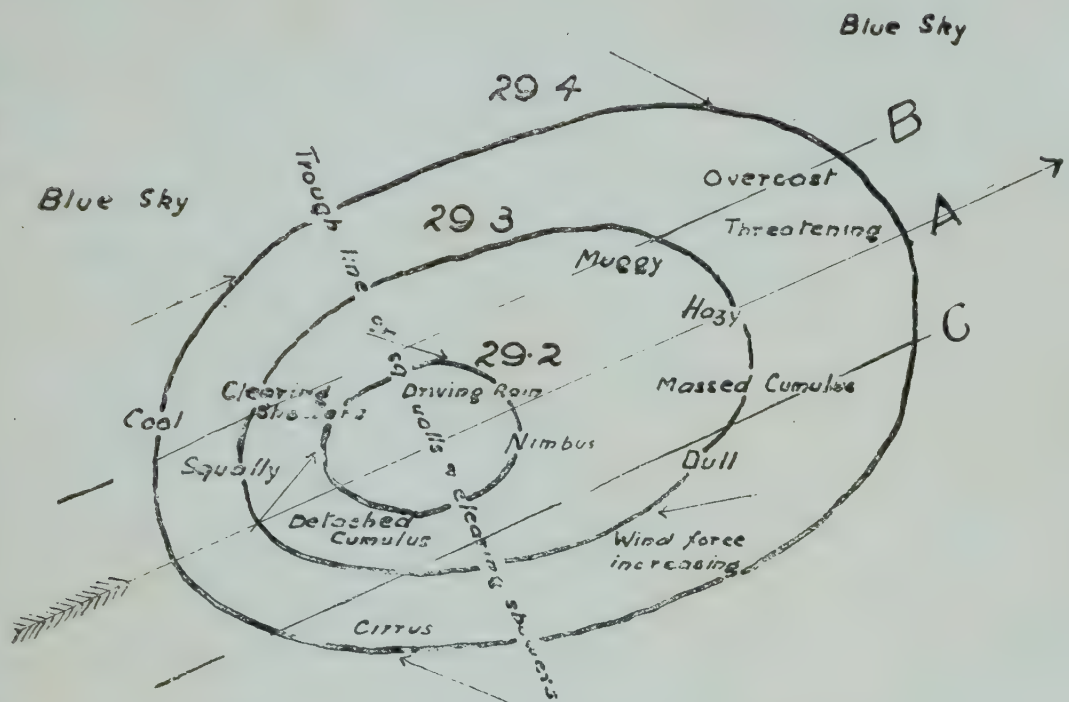
By SIDNEY F. SIMMS, F.R. Met. Soc.

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It is the intention of this paper to explain, as briefly as possible, a few of the principles of weather forecasting, and to shew what can be done by an individual who has eyes to see and instruments at his disposal. In the absence of a properly established system of official daily weather forecasting, such as obtains in Europe, America, and most of the older Colonies, much can be done by an agriculturist who leads an outdoor life, and has, therefore, an opportunity of keeping a constant watch on the sky for signs of a change. It should be remembered, however, that success in forecasting cannot be attained at once. Weather study is a science of observation rather than an exact science, and experience is the greatest factor which makes for success.

Wherever possible, an observer should instal a Kew pattern mercury barometer and a standard hygrometer (wet and dry bulb thermometers). Although these instruments are not indispensable, they are, in the absence of any general knowledge of weather changes, of so much assistance that an observer is greatly handicapped without them. A Kew pattern barometer would cost, landed in Salisbury, about £7, and a standard hygrometer about £1 10s. Buyers would be well advised to order these instruments through a local firm, as owing to their extreme fragility, breakage in transit might easily result, to the pecuniary disadvantage of the buyer. When ordering, care should be taken to ensure that a Kew certificate is also supplied for each instrument, so that the necessary corrections to be applied to the scale readings are known.

In the absence of these instruments, reliance must be placed wholly upon observations of what are generally termed



The small arrows fly with the wind  
The large arrow indicates direction in which the system moves  
Fig 1 Shewing structure of a cyclone

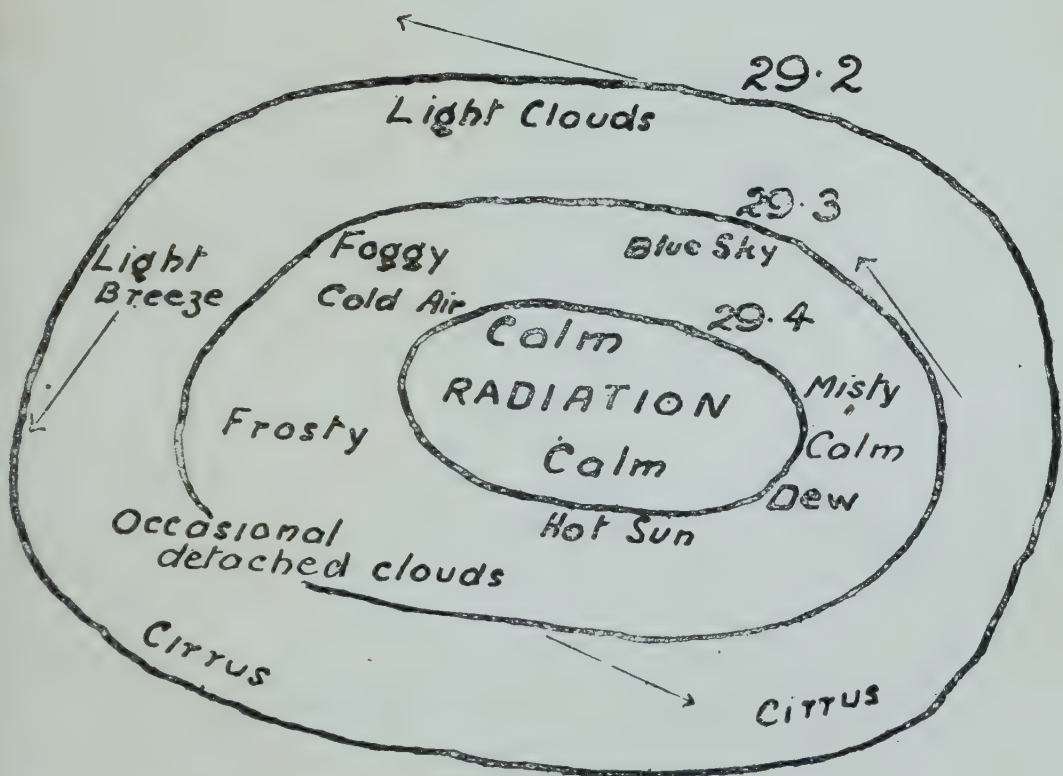


Fig 2 Shewing structure of an anticyclone





“non-instrumental phenomena”; that is, winds, clouds, haze, halos, coronas, and the like. In England it is considered that this method can never be superseded for use among fishermen, sailors and shepherds,\* but in England the country people have accumulated centuries of weather lore, which serves the purpose admirably. In Rhodesia, where, as far as meteorology is concerned, we are but in the earliest stages of our knowledge, we could not place much reliance in weather lore, even if there were any, since it has not had the opportunity of standing the test of time. In this connection it should be mentioned that, generally speaking, it is a mistake to place any confidence in the forecasts of natives. The natural presumption is that the native should, by virtue of indigene, be in the best position to know the eccentricities of the weather, but this is not so, and no reliance can safely be placed on information from this source. In these circumstances, observers are advised to obtain instruments wherever possible, and throughout this paper it will be assumed that instruments are available.

Every phenomenon of weather is the logical outcome of some preceding atmospheric movement, and when we have discovered the various causes which bring about the multitudinous effects visible any day, we shall be in a position to observe the cause and anticipate the effect. It is for this reason that the barometer is such a useful instrument in forecasting, as will presently be seen.

For our purpose we may consider the origin of all atmospheric movement to be variation in pressure. Broadly speaking, pressure may be considered as being of two kinds; that is, the cyclone and the anti-cyclone. A cyclone is an area of low pressure, and may be described as a depression in the atmosphere similar to a whirlpool in water. The pressure of the atmosphere begins to decrease at the edge of a cyclone, and becomes less as the centre is approached. The accompanying diagram (Fig. 1) illustrates the nature and structure of a cyclonic depression. The lines describing the cyclone are called isobars, because they are lines of equal barometric pressure. A forecaster, who is kept posted by daily weather

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\* Hon. R. Abercromby, “Weather.”

telegrams from different centres in the area for which he is compiling his forecast, uses these means for plotting the state of the weather at any one moment over a map of his area, and he is then able to take a bird's eye view, as it were, of the position. The readings of the various barometers, properly corrected and reduced to 32 deg. F. and sea level, are placed against the station to which they refer, and a line is drawn joining up each one of, say, 29.4 inches. A similar line is then drawn through all places with a pressure of 29.3 inches, and so on in tenths of an inch. The forecaster is then able to see whether a cyclone is crossing the area or if an anti-cyclone is lying over any particular spot, and so on. This method of illustration is in universal use, and is the simplest and most easily understood. When thinking of a cyclone, the reader should imagine a vast crater, the outer line in Fig. 1 representing the top edge and the inner lines at alternate distances down the slope. The anti-cyclone is the reverse of this; that is, an inverted cone, having its apex pointing upwards. In this way a good idea of the nature of these systems is obtained. The difference in the slopes of the sides or gradients will then be clear. We can see, for instance, that from the point "A" (Fig. 1) to the centre along the line of direction, the downward slope is gentle, but after passing the centre and approaching the rear the slope is much steeper. Where these gradients are steep, the weather will be more violent; in general it is the steepness of the gradient which determines the intensity of the weather.

It will be seen that the tendency of a depression is to cause the winds to blow inwards towards the vortex, in a direction *with the hands of a watch*. The lines, or isobars, shew a difference of one-tenth of an inch between each, commencing at the outer edge with 29.4 inches and decreasing towards the centre until the pressure is only 29.2 inches. Along the trough line squally weather may be expected, while immediately ahead is driving rain. In the rear there are patches of blue sky and occasional clearing showers, while after the passage of the cyclone, blue sky is seen, and dry weather again settles. It will be obvious that a barometer erected at the point marked "A" would shew a steady decrease of pressure until the advent of the centre or rain area, provided the cyclone passed in a direct line. After passing the rear edge of



the inner circle, the barometer would begin to rise steadily until it indicated 29.4 inches, when the last vestige of the cyclone would pass and disappear.

Such then are the general principles by which cyclones are governed. We come now to a consideration of the anti-cyclone, which, as its name implies, is the antithesis of the cyclone. On reference to Fig 2 it will be seen that the least pressure is at the outer edge, increasing to its maximum as the centre is reached. The effects are then converse to those of the cyclone. The wind, for instance, blows spirally outwards, in a direction *against* the hands of a watch. The centre of the system is an area of calm, where both solar and terrestrial radiation are at their maximum. In winter, when these systems are most frequent, we may expect dew, mist, frost, fog, etc., near the centre, while at the outer edges the weather is milder, with light breezes. Atmospheric humidity is then low, as is also the shade temperature, for with the increase of pressure the temperature becomes less, and *vice versa*. Unlike the cyclone, these systems rarely move in any given direction, but remain stationary, sometimes for weeks at a time, over an area until broken up.

So far we have assumed that a falling barometer brings rain and a rising barometer settled, calm weather. But it occasionally happens that rain occurs, accompanied by high winds, when the barometer is ascending, and again, upon occasion, while the barometer is shewing a rapid decrease of pressure, the weather remains settled and fair. These apparent anomalies would, at the first glance, appear to reflect some doubt upon the theory just explained, but there are few cases of this sort which are not capable of explanation. Referring again to Fig. 1, let us suppose that there is a barometer at the point marked "C." We notice the mercury falling steadily, the sky becomes overcast, and there is every indication of rain until we arrive at the trough line. Passing this stage we encounter detached cumulus clouds, and then, as the mercury rises, the wind changes, and in popular phraseology, "blows the storm away." Consequently, although we have actually passed through the cyclone, we have missed the rain area, and for this reason our weather has remained fine. Following this line of argument, let us suppose that a barometer is erected at

the point "B." We notice almost similar conditions to those obtaining at the station "C"; the air is muggy and oppressive, the pressure is decreasing. As the cyclone advances, we miss the driving rain belt which passes to the left, encountering the trough line. With the first rise of the mercury, the wind increases in force owing to the steepness of the gradient. Our winds here "blow up" the squalls and clearing showers, and while we encounter the rain and pass through the storm, our barometer is indicating settled weather! There are other explanations which cover various different types of weather, but the exigencies of time and space will not allow of a very detailed discussion of cyclonic systems now. It is hoped, however, to deal with this phase in greater detail at a later date. The importance of the subject cannot be over-estimated, and where it is to be studied seriously and in detail, it is very desirable to obtain some reliable work by a recognised authority which would deal with the points thoroughly. The intention here is only to explain the necessary principles, and there is no occasion to indulge in a lengthy discussion of the various different forms of depressions, but if the reader desires to make a study of this most fascinating subject, either for pleasure or for general uses, the following works will be found most helpful:—"Weather," by the Hon. R. Abercromby, published by Kegan, Paul Trench & Co., Ltd., Dryden House, Gerrard Street, London, W.; "Elementary Meteorology," by R. H. Scott, by the same publishers; and "Meteorology, Practical and Applied," by Sir John Moore, published by Rebman, Limited, 129, Shaftesbury Avenue, London, W.C. These works treat the subject exhaustively and clearly, and would prove most helpful adjuncts to the outfit.

Passing from the general principles of cyclonic systems, we may now consider two forms of barometric fluctuations, *e.g.*, diurnal and periodic. Diurnal fluctuation of pressure is the daily variation of the barometer, from 9 a.m. on any one day to 9 a.m. on the next. Periodic fluctuation, on the other hand, is the annual curve of pressure, and it is to this factor that we must look for an explanation of our seasonal changes. In Southern Rhodesia, by reason of its geographical position, this annual variation of pressure is well marked, shewing a uniform fall and rise, in the inverse ratio to the



rainfall curve. This is explained by the fact that "a belt or ridge of comparatively high pressure encircles the earth at the tropics, both north and south of the Equator, while over the Equator and the immediate vicinity to 10 deg. or 15 deg. north and south, the barometer stands from one-tenth to two-tenths of an inch lower. In the Northern Hemisphere, this ridge lies approximately along latitude 35 deg., and in the Southern Hemisphere it is situated about latitude 30 deg.; that is, in the neighbourhood of Durban. These belts oscillate backwards and forwards with the season; in January the northern zone approaches the Equator, while the corresponding southern zone recedes from it. Conversely, in July the northern zone recedes northwards, while the southern zone advances towards the Equator." \* The result of this system is the formation of a trough of low pressure which advances in a southerly direction over Rhodesia during our summer months, bringing with it our rainy season. Unlike the cyclone, the isobars describing this system would be nearly straight, and the whole area of depression might be likened to an inverted triangle or V, having its apex on the earth's surface. Now if we take any V-shaped object and place its apex on the Equator at longitude 31 deg. 30 min. or any meridian passing through Rhodesia, and assuming that the slopes are of such a length that the one end is over latitude 35 deg. north and the other over 30 deg. south, we may readily understand how this equatorial trough of low pressure operates upon our climate. Let us call the apex of our V the point "A," the north end "B," and the south end "C," and further let us assume that we commence with the month of October. At this period the point "A" should be on or near the Equator. Then move the V in a southerly direction, bringing the point "B" to the Equator in January: this movement has caused a general advance of a low-pressure system between the points "C" "A" in the direction of Southern Rhodesia, bringing with it our early rains. The Rev. Father Goetz, S.J., M.A., F.R.A.S., Director of the Bulawayo Observatory, has found that in the middle of our rainy season, that is between the middle of December and the middle of January, there is an appreciable break in the rains, forming what may be practic-

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\* Sir John Moore, "Meteorology, Practical and Applied."



ally described as a drought. \* These periods of drought are well marked and “nearly a feature of our climate,” and are probably due to the passage beyond our borders of this trough of low pressure. If we pass our V right down to the Limpopo River, we will see how the same movement brings a system of increasing pressure in the wake of the trough—that is, between the points “A” “B.” When the point “C” has reached its southernmost limit, in January, it begins to return northwards, and this movement causes a decrease of pressure in this territory as the points “A” “B” are carried forward. The result is the trough again passes over us on its return journey, bringing with it our late rains. Still moving our point “A” northwards, we see how the points “C” “A” bring a general increase of pressure, which results in the termination of our rains and the advent of winter. The truth of this assertion will be amply demonstrated if reference is made to the available pressure statistics as published in the Annual Meteorological Reports from time to time. It will be seen that, generally speaking, we encounter the period of highest pressure in July and the lowest in December or January.

*(To be continued.)*

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\* “Dry Season and Droughts in Rhodesia,” *Rhodesia Agricultural Journal*, August, 1913.

# Poultry Keeping in Southern Rhodesia.

(CONTINUED.)

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By C. C. GIRDLESTONE.

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## HOUSING AND GENERAL MANAGEMENT.

The housing and accommodation of poultry, from chick to maturity, are problems which, bearing in mind the extremely high cost of the materials needed in the construction of suitable buildings, runs, etc., call for much thought and contrivance.

As a set-off to the high price of materials, however, our climate is more favourable than in most countries where cost of wood and iron is normal, and consequently stock does not require such careful safeguarding from exposure to cold and damp.

There is no doubt that many of the failures and disappointments so frequently experienced here might be avoided, or at all events greatly minimised, if a few hard and fast principles of management were thoroughly understood before the introduction of any stock. Suitable sleeping quarters, pens, and enclosures, some shelter from rain, sun, and cold winds, must be provided, and a definite system of treatment evolved at the very commencement.

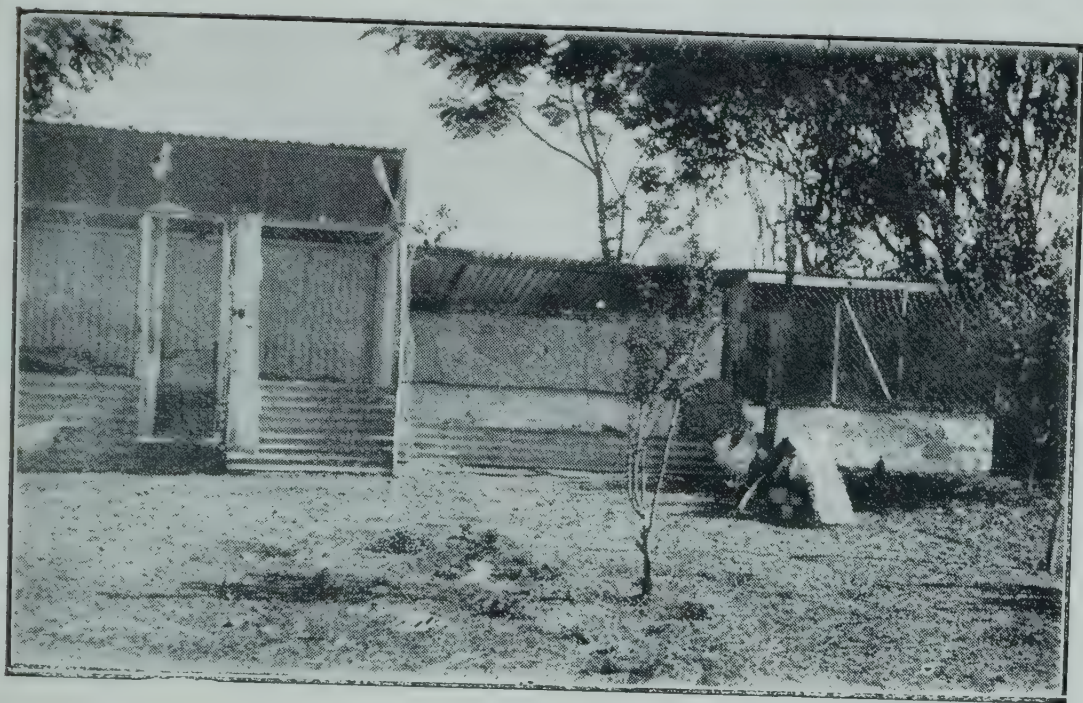
Unless some capital can be set aside expressly for poultry, and much care and attention unceasingly given to it, then it is cheaper to buy the product at current market prices, however high, rather than to produce it. It is no unusual thing

to see valuable birds dumped down on the plot or farm, without house, run, or even a nest box, and their owner will invariably ascribe the consequent failure and loss of many of the birds to unsuitability of climate. Both laying and breeding stock must be housed and penned to give the best results it is capable of. In the absence of such attention and restraint, proper feeding cannot be assured, laying qualities deteriorate, many eggs are deposited in obscure nesting places, and both eggs and birds are at the mercy of stray natives, dogs, and other chance marauders.

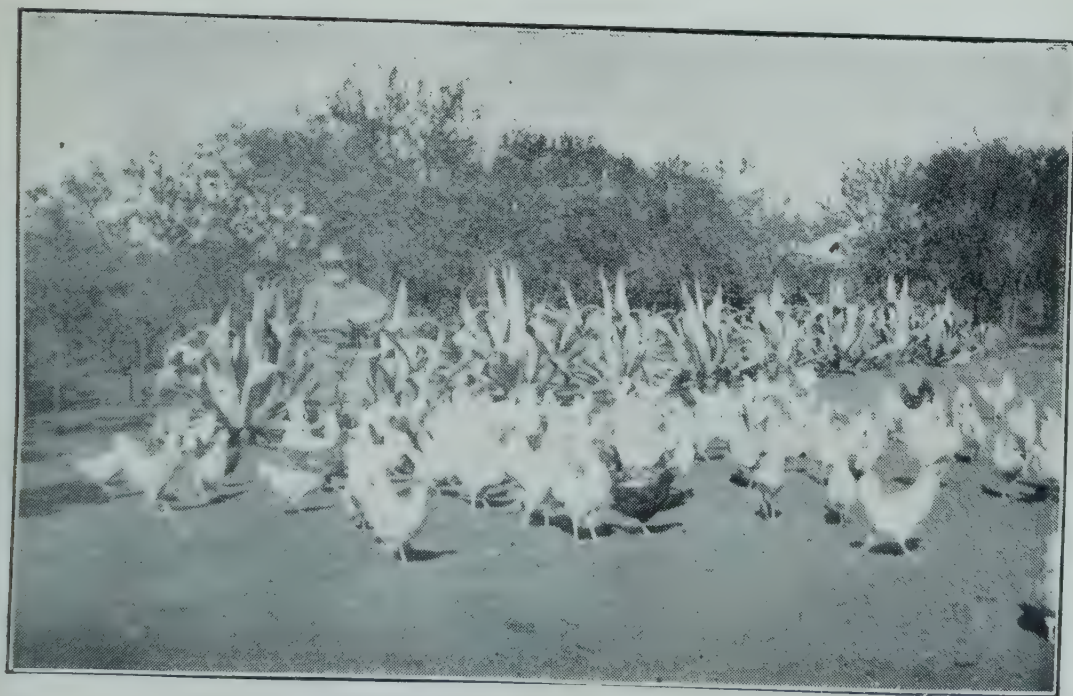
The first consideration should be the selection of the most suitable site for the initial buildings and runs, and this is a question to be carefully studied, as upon it largely depends the success or failure of future operations. Choose a position conveniently near the dwellinghouse, but keeping in view the possibility of extension as the stock increases. Buildings should face the north if possible. This will permit of the sun penetrating the greater portion of the interiors, and at the same time will afford protection from the prevailing winds and rains, which mostly come from an easterly direction. A well-drained site is most desirable, so that heavy rains may be quickly led away. Waterlogged ground and stagnant water are both potent sources of sickness and mortality.

In the runs, shade from the sun is essential, and for this reason an orchard, if available, is one of the very best sites. On many farms, and most plots, trees of some sort have been planted as screens and wind-breaks; these should be utilised to the best advantage, and the houses and runs so placed as to distribute the shade over as large an area of the confined space as possible. The provision of shelter from the sun is not advocated from the "show-man's" point of view of avoiding discoloration of plumage, but as a vital factor in maintaining full health and vigour. Laying birds, more than others, require exercise, and the provision of ample shade promotes the activity indispensable for the proper assimilation of their food. Without it, the best laying stock that money can buy, whatever their feeding, will in the course of a few weeks become inert and listless; the eggs they lay will not pay for their keep, and from loss of vigour and condition they will be





Simple Poultry Houses.



Imbezu Kraal Poultry Farm.



useless as breeding stock. This is not theory, but the forceful conclusion of experience dearly bought.

If the runs can be located on grass, so much the better, as it is without doubt the best ground surface for them, but in the dry season this is not always practicable. *Paspalum*, if well mown or closely grazed by cattle or small stock, is an excellent grass for this purpose, and affords a green picking in many of the months when other varieties are parched and brown. Poultry do not take very readily to it at first, but it soon becomes palatable to them, and they condition well on it.

Simplicity of construction in all poultry houses is strongly advocated. Not only must cost be kept as low as possible, but insect pests and disease suppressed, and to this end all interior fixtures and fittings should be restricted to the limits of bare efficiency. All woodwork other than perches and the skeleton framework of the building is best dispensed with. Wooden walls, board floors, elaborate nest boxes, are ideal strongholds for the various insect pests the flesh of poultry is heir to, as whatever precautionary measures are taken, there are always crevices and projecting joints which cannot be reached.

For laying stock, build small portable houses, of a size to contain about 25 full-grown birds with comfort, and a wire netting enclosure to each, 50 feet long by about 15 feet wide. Birds kept on this principle, in small flocks of not more than 25 to 30, will give far better proportionate results than a greater number allowed to congregate together. By the adoption of this system, more individual attention can be given; there is no crowding or fighting for rations, and each bird has a fair opportunity of developing its best characteristics. A house 8 feet long by 5 feet wide, 6 feet high at front and 5 feet at back, will suffice for the night accommodation of a breeding pen or for 30 laying birds. For the latter this is allowing considerably less space per bird than is generally advocated, but poultry is of no use to us if a fortune must be spent on housing. Practical experience has proved that the foregoing dimensions are ample, provided such structures are used as sleeping quarters only, all nest boxes being outside, and perches removed in the morning, or the birds excluded altogether during the daytime.



The same house accommodation is advised for a smaller pen of breeding stock, with a larger run if possible. In this case the first consideration is not the immediate profit of egg-production, but rather perfect health and condition of the pen, in order to obtain fertile eggs capable of developing healthy chicks of good stamina. Some extra trouble and expenditure to this end is amply repaid. For framework, 3 in. by 2 in. deal is preferable to native timber, as being more resistant to borers and other wood-eating insects. Corrugated iron may be used for roof, ends and back, and for the front, wire netting only, with the least possible woodwork to support the door. Corrugated iron is recommended as being readily obtained, but a cheaper substitute will, of course, be used if available. Cement drums flattened out are quite serviceable, and although in using them construction is more tedious, the saving effected will repay the additional labour involved.

Perches should be about 2 in. wide, and the most suitable material is 3 in. by 2 in. deal, sawn to give two pieces approximately  $1\frac{1}{2}$  in. by 2 in. The top edges must be planed off to an oval shape to afford comfortable foothold. A house of the dimensions given will need four perches, from back to front. They must be removable, either resting on sockets attached to the framework, or suspended from the roof by strong wires. Wherever native timber is obtainable, it will doubtless enter largely into the construction of all buildings, as the saving in cost is a consideration not to be disregarded. The straightest and most even poles should be selected, carefully stripped of all bark and projections, and thoroughly saturated with carbolineum or a similar preparation to render the wood distasteful to white ants, borers, and other insects. All wood, both native and imported, should be so treated. Frequently spray the interiors of all buildings with cattle dip or some strong insecticide. Tampan, fleas, and lice are the worst enemies of poultry here, and no pains must be spared to check their increase.

With the restricted house room recommended, scratching sheds are a necessity, affording space sheltered from sun and rain in which the birds must search for every grain of food, and ensuring a good deal of the exercise so indispensable to their welfare. Their construction is simple. A roof of iron or

thatch as protection from sun and rain, a 12 in. barrier front and back of wood or iron to retain the scratching material, and the back closed in with grass or sacking, is all that is needed. The floor should be strewn with short litter, such as chaffed straw or grass, to the depth of at least six inches, and in this all grain must be well distributed. At all hours of the day the birds will find some occupation here, and the small expenditure in labour and material is well repaid.

The accompanying photograph will serve to illustrate an alternate house and scratching shed system utilised for both breeding and laying stock with good results. It is not intended to portray model buildings, however, as only materials which happened to be at hand were used.

## Notes on Bee-Keeping.

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By FREDERICK SWORDER, Hallingbury, Hartley.

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The frame hive is specially adapted for securing any honey not consumed by the bees, and it is this surplus which makes bees pay. Experience shews that our seasons are not uniform, and as our honey flow is thereby affected, it behoves us to be ready. Last year, although the season was a very late one, it was a good one.

In good sasons bees will bring home much more food than will suffice for their winter requirements, and if we assist them by giving comb foundation and building them up in the early spring, the possibilities are that our harvest of honey will be greater.

The question is repeatedly asked, "How long a time will it take bees to fill with honey all the sections in a crate?"

To this question no direct answer can possibly be given, for the conditions governing the flow of nectar in each season vary very much. Should any hive contain a less number than 8,000 bees, headed by an old queen, and there is a scarcity of honey in the district, it may be fully a month before the crate is completed. Yet compare this indifferent state of things with a strong stock numbering 40,000 to over 60,000 bees, headed by a young and vigorous queen, laying at the rate of 3,000 eggs per day, and a plentiful supply of nectar near at hand, where short journeys mean so much more brought home in the same time. Then it is a pleasure to watch the hurrying workers, and from outside observation we know that they are doing their best to fill the crate in from 10 to 15 days.

The shorter the period the crate remains on the hive so much better in every respect will the sections be completed;



at the same time the crate will be more easily removed, whereas with the longer period required to fill the sections more difficulty will be experienced in removing it. This is due to the apparently superfluous quantity of propolis used by the bees. When this happens all the wood portions of the interior fittings are plastered with a superabundance of this black and sticky substance. By observation and by following the hints mentioned in the previous article, it can be readily ascertained when the sections are filled and ready to be taken off the hive. In most instances the crate will be stuck fast to the tops of the frames by propolis; therefore, in order to avoid crushing bees (which must end in the operator being stung), care and patience must be exercised in its successful removal, otherwise failure will result at the first attempt.

Go to the hive, taking with you a screwdriver, carbolic cloth and the smoker, but first blow a few puffs of smoke into the entrance. Some bee-keepers accustomed to the disposition of their own bees occasionally omit this precaution, and at times I do the same, but in most cases it is advisable to drive in the guards at the entrance, and then after about half a minute has elapsed the roof and the hive lift may be removed and set on the ground. After this, expose the crate by removing all the warm clothing surrounding it. All the quilts, except one, covering the crate should now be taken off; the remaining quilt for the time being will prevent the upward escape of bees.

Now stand at the back of the hive, and with the thumb and index finger of each hand take hold of two corners of the carbolic cloth, allowing the remaining portion of it to hang down in front of the hive. Grasp the two corners of the quilt farthest from you, and pull both towards you, being certain that this quilt is being followed by the carbolic cloth. If it has been correctly done not a bee can escape. It will thus be seen that the carbolic cloth has now taken the place of the one remaining quilt. The odour from the carbolic cloth is fast driving down the bees into the brood chamber, and also thoroughly subduing them, while the crate of honey is being rapidly cleared of them. That the carbolic cloth is having the desired effect may be gathered from the roaring sound proceed-

ing from the crate. Should many bees be driven out at the entrance, do not be alarmed, for they will soon crawl inside again as the carbolic odour passes off.

Now insert at each corner of the crate nearest to you a screwdriver between the frames and the bottom of the crate, and lever it up about half an inch. By inserting in this space two small pieces of wood, the crate is prevented from returning to its former position. There must be no failure to remember this very important point, for it is the secret of success. If the crate of honey, after having been once raised, is permitted to fall or rest again on the frames, many of the bees will be maimed and killed, and the workers will retaliate with vehemence, for the innocent sufferers in the hive are putting forth their stings. If the apiarist has occasion to lift up the crate again, it is then that he is compelled to make free use of the smoker.

Now quickly remove the carbolic cloth from the top of the section crate, and in its place lay on one quilt. Both hands being free, take hold of the corners of the carbolic cloth as previously described, allowing it to hang down again in front of the hive, and with the palm of each hand grasp each side of the crate; then give it three or four twists to right and left. Being assured that all comb connections between the frames and crate have been severed, draw it towards you, followed by the carbolic cloth. Leave this cloth on the frames, and set the crate of honey diagonally on the top of the hive lift. The small number of bees that are left in the crate will not sting, as they are thoroughly subdued, and can be dealt with presently. Do not set the crate down on either the ground or even on a flat board, otherwise the few remaining bees in the crate will be crushed, and their sisters will be a cause of trouble to you.

If the honey flow is not yet finished and it is thought advisable to put on another prepared crate of sections, now is the best time to accomplish it. Simply remove the carbolic cloth quickly from the frames, and at once set on the fresh crate; on top of this place some quilts, also the hive lift and roof, and the operation, which can be carried out in far less time than it has taken to describe, is over.

Previously to putting on a fresh crate, clean off all comb connections or odd pieces of wax and propolis from the tops of the frames. Do this with a proper scraper knife, so that the crate rests evenly in position. While this is being done, the bees can be kept from doing injury by the smoker or carbolic cloth. The crate of honey and also the carbolic cloth can now be carried to a dark out-house or room, where the cloth should be spread on a table or box. If any bees are still adhering to the bottom of the crate, hold it over the carbolic cloth for a few moments to cause the bees to run up into the sections out of harm's way, and then set it down. This avoids crushing workers, who soon clear upwards to the light and soar away for home.

Carefully remove each section separately, packing it away into a bee-proof box or large biscuit tin, and when the opportunity offers, scrape off with a blunt knife all the propolis from the wooden portion of each section, making it fit for market or the show bench.

While some bee-keepers are in favour of using the sheet of excluder zinc, others again seldom put it under the crate; personally I have practically discarded it. Occasionally a prolific queen will go up into the sections, but as a rule she will not long remain there, for she finds herself cramped for want of room. To prevent the crate unduly sticking to the frames, the bottom of it may be rubbed with vaseline. Sometimes bees will not readily go up into the crate, and the sections are not nicely completed; therefore, it should be well covered with warm clothing. Bait sections, *i.e.*, sections left over from the previous season and partially filled with honey, are a great inducement to start bees going up. I have now over fifty of these on hand for distribution in my crates for the approaching season.

In connection with this operation of removing a crate of honey from a hive, it will be noticed that I have entered somewhat freely into details. If all the points are borne in mind, efforts cannot fail, yet in order to make oneself proficient and also to gain confidence, it will be a good plan to practise beforehand that which it is intended to carry out with two boxes.



Many novices far removed from civilisation, while being desirous of keeping bees, may never have the opportunity of witnessing this operation, and have to struggle on as best they can, yet if they could only make the effort and get into touch with someone who is willing to explain the whole thing from beginning to end and its simplicity, many mistakes would be avoided, while much benefit would be derived.

In nearly every continent, agricultural shows encourage farmers and horticulturists to take an interest in bee-keeping by arranging classes for exhibits of honey and bee appliances. Lectures and demonstrations with live bees are given by an expert, who explains the uses of the various appliances, and at the same time is able to answer questions and put the novice on the right track.

It is encouraging to realise that Rhodesia is doing something to meet this want, and there are evident signs that these efforts are creating an interest among those who are devoting attention to fruit growing.

*(To be continued.)*

# Report of Veterinary Conference

Held at Bulawayo, 10th April, 1913, and following days.

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PRESENT : Mr. J. M. Sinclair, Southern Rhodesia (Chairman); Mr. C. E. Gray, Union of South Africa; Mr. Wm. Robertson, Union of South Africa; Mr. R. J. Stordy, British East Africa; Mr. W. H. Chase, Bechuanaland; Mr. G. Garden, Nyasaland; Mr. F. A. Verney, Basutoland; Mr. W. A. Elder, Swaziland; Mon. M. van Raes, Belgian Congo; Senor J. B. Botelho, Portuguese East Africa; Mr. F. Chambers, Northern Rhodesia; Mr. C. R. Edmonds, Southern Rhodesia; Mr. H. L. Jones, Campanhia de Moçambique.

## RINDERPEST.

The Chairman briefly stated the reasons which had caused His Excellency the High Commissioner to convene the Conference, and bade all the delegates a hearty welcome. He suggested that Mr. Stordy should address the meeting, and said their thanks were specially due to the Administration of the British East Africa Protectorate for permitting their Chief Veterinary Surgeon (Mr. Stordy) to attend the Conference and give them the benefit of his recent campaign again rinderpest.

Mr. Stordy stated that rinderpest had been prevalent in East Africa and Uganda during the past three years, causing a mortality estimated at between 40,000 and 60,000 head. He exhibited a map of East Africa and Uganda shewing the clean and infected portions of these territories. He pointed out that the River Nile had so far prevented the spread of rinderpest into the Western Province of Uganda. With an outbreak of the disease in German East Africa at the south end of Lake Victoria Nyanza, their hitherto clean areas were now threatened with invasion. It was estimated that there were some 500,000 head of cattle in the clean areas, and it was from this part of the country that the susceptible cattle necessary for the production of anti-rinderpest serum were obtainable. Once the disease was established in the areas west of the Nile it would spread with great rapidity, as the cattle in these areas had escaped the former visitation of rinderpest. It, therefore, behoved the authorities to avail themselves of the opportunity now offered, and manufacture large reserves of serum. Serum could be produced at the present time at a comparatively cheap rate, but once the supply of susceptible cattle was cut off its production would become very expensive. Before leaving Nairobi, he (Mr. Stordy) had had an interview with His Excellency the Governor. His Excellency was prepared to render all assistance in his power to the several Governments concerned in the prevention and suppression of rinderpest, and he (Mr. Stordy) was instructed to say that provided the cost of the production of the necessary serum did not appear on the East Africa Protectorate Estimates, he was at liberty to place before the Conference a proposition for its supply. Continuing, Mr. Stordy stated that the German East Africa Protectorate had already been supplied with 10,000 doses of serum, and he went on to say that while the outbreak of rinderpest in German East Africa and the south end of the Great Lake was surrounded by broad belts of tsetse fly, yet numerous buffaloes abounded in these areas, and that on the extension of the disease they might migrate to the hitherto clean area, carrying the disease with them. Mr. Stordy then read a letter which he had addressed to his Government on the question of the production of anti-rinderpest serum, and, proceeding, said that in view of the danger from the spread of rinderpest to South African States, his Government was prepared to

supply up to 250,000 doses per annum of rinderpest serum at the approximate rate of one rupee per dose, provided always that susceptible cattle were available from the Western Provinces of Uganda, and that laboratory assistance was given to the Veterinary Pathologist.

The Chairman asked Mr. Chambers what number of cattle there were in North-Eastern Rhodesia, and how many doses would be required in event of an outbreak.

Mr. Chambers replied that, so far as could be made out, rinderpest would first make its appearance on the northern border of North-Eastern Rhodesia. There were not many cattle there, and they were mostly owned by Europeans; there were few native cattle. Then the disease might also come down through Nyasaland. There were about 300,000 head of cattle in North-Eastern Rhodesia, and they would require 340,000 doses of serum in the event of an outbreak. The number of doses he would require at the outset to carry on with would be 20,000 doses.

Mr. Garden, replying to a similar question put by the Chairman, said that in Nyasaland they would require 20,000 doses to commence with, and 100,000 doses would immunise all the cattle in that territory. In the northern districts of the territory there were about 60,000 to 80,000 head of cattle, 2,000 to 3,000 of which were owned by European farmers.

Mr. Botelho stated that 15,000 doses would be sufficient for the cattle in his territory.

Mr. Van Raes stated that his territory had no cattle south of the Congo. In Katanga there were only a few, and in Elisabethville there were only about 200 head of cattle. They had cattle in the north, between German East Africa and Uganda and Kivu, but they were only native cattle. This was quite a new country, and had only been occupied for two years, and, therefore, they had no reliable statistics of the number of cattle. There might be from 10,000 to 15,000 head between Kivu and Tanganyika. The disease would take a very long time travelling down, being only carried by game, and an outbreak in Kivu would have to go through Uganda and German East Africa. They would want at the outside 1,000 doses of serum.

Mr. Jones explained that the part of Portuguese East Africa which he represented was the territory of the *Campanhia de Moçambique*, extending from the Zambesi River to Sabi River, and that Mr. Botelho represented the remainder of Portuguese East Africa, both north of the Zambesi and south of the Sabi Rivers. In the territory of the *Moçambique Company* there were between 18,000 and 20,000 head of cattle, about 7,000 of which were to be found on the southern banks of the Zambesi River from Tambara to Marramen. There were no cattle between there and ten miles north of the Beira and Mashonaland Railway, chiefly because of the existence of huge fly belts. He considered that 10,000 doses of serum would be sufficient for his Government in case of emergency. Proceeding, Mr. Jones explained for the benefit of Mr. Botelho that to the north of the Zambesi the distribution of cattle was as follows:—Immediately south of the German territory there were about 3,000 head. Between these and the next herd there were 2,500 head, and at *Moçambique* there existed huge fly belts. Still further south in the *Quilimane* district there were 20,000 head of cattle, but a fly belt existed between the two places. The most important district in the Government territory as far as this disease was concerned was Tete, which lies to the south of Nyasaland. Here there were about 10,000 animals. In the Portuguese Government territory south of the Sabi River there were about 66,000 head.

Mr. Botelho said the Portuguese Government would require about 15,000 doses in reserve. They had to guard two places, Tete and the northern portion of the territory.

The Chairman stated that for Southern Rhodesia, 50,000 doses in reserve would be sufficient.

Mr. Gray said that so far as the Union was concerned, 40,000 to 50,000 doses would be sufficient; say, 40,000 doses.



After further discussion, the following resolution was adopted :—

That the various Governments mentioned below establish reserves of serum of the amount indicated in this schedule, and obtain their supplies by subsidies to the Administration of British East Africa.

|                                  |        |
|----------------------------------|--------|
| Northern Rhodesia ... ..         | 20,000 |
| Nyasaland ... ..                 | 20,000 |
| Portuguese East Africa ... ..    | 15,000 |
| Mozambique Company ... ..        | 10,000 |
| Union of South Africa ... ..     | 40,000 |
| Bechuanaland Protectorate ... .. | 20,000 |
| Belgian Congo ... ..             | 1,000  |
| Southern Rhodesia ... ..         | 50,000 |

The Basutoland and Swaziland representatives did not think it necessary to establish a reserve of serum at present in their territories, owing to these countries being at present so far distant from the area infected with rinderpest. Should the disease threaten Basutoland and Swaziland, they considered there would no doubt be a large local supply of serum.

The Chairman said they would now pass on to the question of the production of serum. Mr. Stordy had informed them that provided they granted the authorities of the Veterinary Department in British East Africa sufficient financial assistance they were prepared to produce the amount of serum required within 12 months. He took it that financial assistance required would be for an extension of buildings, for equipment, for a supply of cattle, and for veterinary assistance.

Mr. Stordy detailed the estimated cost for the production of half-a-million doses of serum, amounting in all to £24,700; which would work out at one rupee (1s. 4d.) per dose.

Mr. Chase asked permission to re-open the question of the quantity of serum recommended for the Bechuanaland Protectorate. He wished to know whether, in view of a contribution being made, they would be asked to contribute in comparison with the number of doses they had asked for as a reserve.

The Chairman, in reply, said that the whole cost of producing this extra serum would be worked out at so much a dose, and those who asked for 20,000 doses would have to pay accordingly.

Mr. Chase said he could not recommend his Government to contribute for serum half as much as the Union. He considered that the Union ought to contribute more than double the amount the Bechuanaland Protectorate should. If rinderpest broke out in the Union they would require a great deal more than 40,000 doses.

The Chairman pointed out that this was only a reserve to enable them to tackle the commencement of an outbreak and start operations at once. He did not agree with Mr. Chase regarding the Bechuanaland Protectorate; that territory stretched right up to the Zambesi, and was almost as near the seat of disease as Southern Rhodesia was.

Mr. Chase reiterated that he did not consider it was a fair ratio for the Bechuanaland Protectorate to contribute half as much as the Union. No provision had been made for Basutoland and Swaziland to contribute. If they agreed to include Basutoland and Swaziland it would not be so bad, and they would be more likely to get an Imperial vote.

Mr. Gray considered that if the disease invaded the Union and they could not check it with the use of the 40,000 doses, they would have to provide their own supplies, which, as they had the machinery, they could do. The Bechuanaland Protectorate, however, were not in a position to do this.

The Chairman pointed out that if the Transvaal and the Bechuanaland Protectorate happened to be invaded at the same time, the Transvaal would not be able to supply the Bechuanaland Protectorate until they got to the stage where they were producing more than they required.

Mr. Chase said he knew it was no use recommending this to his Government, and, therefore, the number of doses had better be cut down. He quite recognised that Mr. Stordy's proposal was made with a view to assisting them in preventing the introduction of the disease, and they were all grateful to his Government for the proposal, but he thought they should pay a fair share, and he did not think this ratio was fair. He would like his figure put down at 10,000 doses.

The Chairman again reminded Mr. Chase that his northern border was quite as near the infected area as Southern Rhodesia was, and asked the delegates to express an opinion regarding Mr. Stordy's proposal. He knew that labour conditions there were very difficult, and in the event of his Government agreeing to the proposal before them, he would like to send at least two veterinary surgeons to the rinderpest station to work there, in order to gain an insight into rinderpest work and the preparation of serum. At the present time there were only one or two veterinary surgeons in Rhodesia who had had any experience of rinderpest, and from the point of view of ordinary work it was desirable that several men of the staff should have a knowledge of the disease. He should like to have several experienced men to send to the various points threatened; later on it might be necessary to station men definitely at certain points. Therefore, with regard to assistance, he thought that his Government would agree to his proposal to send two men of the staff to the rinderpest station.

Mr. Gray mentioned that in the event of Mr. Stordy requiring any more men, he should recommend the Union Government to send one or two young men up to him.

Mr. Chambers said his Administration was quite willing to send one man, and if the disease got any nearer they would bring out two fresh men and send them to the station.

In reply to a question put by Mr. Gray, Mr. Stordy said that with a free hand and staff and material, the laboratory could within two months supply 7,500 doses of serum per week.

Mr. Gray said another point was that Mr. Stordy had said it was absolutely necessary to supply Uganda before anyone else, and, therefore, his ability to supply them with serum seemed to him a little doubtful if there were very large demands on his resources by the Uganda Government.

Mr. Stordy said that the German authorities proposed to actually immunise some 30,000 to 40,000 head of cattle north of the Ruaha, a tributary of the Rufigi River, and thus establish a zone of protected cattle with the hope of preventing the spread of the disease south.

Mr. Gray asked whether the estimated price of 1s. 4d. a dose would cover the cost of buildings to be erected and all expenses.

Mr. Stordy replied that it would cover everything. The estimate formed by Mr. Montgomery was only half a rupee, but that was too low on account of the difficulty they had in getting cattle.

Mr. Jones said that so far they had only looked at this question from one point of view, and that was the protection of the States represented by those present at the Conference. Would it not be possible to go a step further and assist the German authorities in actually immunising the cattle along the northern banks of the Ruaha River? He considered that all their energies should be concentrated to prevent the disease crossing that river.

Mr. Stordy said they were now putting an immunised belt across the north of the river.

The Chairman pointed out that in the absence of any representative of German East Africa, it was very difficult for them to say what measures should be taken by that Government.

Mr. Stordy said there were 18 veterinary surgeons in German East Africa. The Veterinary Department had already produced a certain amount of anti-rinderpest serum, and hoped that in six months' time they would be



making all the serum necessary for their requirements. There would, therefore, be two serum stations from which the South African States might obtain their supplies.

The Chairman suggested that the first 40,000 doses should be given to German East Africa if the disease got out of hand.

Mr. Gray pointed out that if the disease was not arrested in Nyasaland and North-Eastern Rhodesia, they would have to start a producing station of their own. Would it not meet the case if they ordered 50,000 doses and all the Governments contributed to the purchase of same, to be used in checking the disease in those countries?

The Chairman said he would prefer to have 50,000 doses earmarked for his territory, but he was prepared to recommend to his Government to contribute a *pro rata* share to fight the disease in those parts.

Mr. Gray asked whether it would not be desirable to reduce the order so far as Nyasaland was concerned; 30,000 doses was a very large amount for that country.

The Chairman said he thought they could reduce the amount to 10,000 doses.

Mr. Gray said his suggestion was that if Nyasaland paid for 10,000 doses, other territories might contribute and give them another 10,000.

Mr. Garden said he did not consider it advisable to cut down the number of doses below 20,000.

Mr. Gray and Mr. Jones were both strongly in favour of all the concentration of their energies to assist Nyasaland and North-Eastern Rhodesia to prevent the disease coming down. Everybody could contribute according to the number of cattle they were interested in.

Mr. Verney considered their only hope lay in producing an enormous belt of actively immunised cattle, but the weak spot was game.

After further discussion the alteration in the schedule proposed by Mr. Chase was agreed to.

Mr. Stordy read his proposition to the Conference as follows:—

In view of the danger from the spread of rinderpest to South African States, my Government is prepared to supply up to 250,000 doses per annum of rinderpest serum at the approximate rate of one rupee per dose, provided always that susceptible cattle are available from the Western Province of Uganda and that laboratory assistance is given to the Veterinary Pathologist.

Mr. Botelho asked whether rinderpest had been discovered in goats or sheep, and what measures were taken in respect to these animals.

The Chairman said that there had been no cases discovered in Rhodesia, and that in rinderpest areas goats were not prevented from travelling.

Mr. Verney said that in the South goats and sheep had contracted the disease.

Mr. Botelho asked whether the disease could be conveyed by game.

Mr. Stordy said that during the present enzootic, no great mortality had been recorded among game. Still this fact did not preclude the possibility of game spreading the disease.

Mr. Van Raes said that if the disease attacked his country they would want 1,000 doses, but they did not want them now.

The Chairman explained that the object of fixing on these doses was to have a reserve supply in each territory in case of an outbreak to enable them to hold the disease until further arrangements could be made for the supply of serum. That would depend on the situation of an outbreak and the rapidity with which it spread.



Mr. Jones pointed out that the cost of 1,000 doses would only amount to £66, and considered that the Belgian Government would surely be prepared to buy those 1,000 doses as a reserve to prevent the few cattle they had from dying.

Mr. Van Raes said he would recommend the matter to his Government.

The Chairman suggested the following resolution for consideration :—

It is strongly recommended that the Governments concerned contribute *pro rata* to the supply of 50,000 doses of serum to be used to combat rinderpest should it extend to Portuguese East Africa, Nyasaland or Northern Rhodesia.

Mr. Gray pointed out that assistance would be just as necessary as a supply of serum. It would be no use having dozens of doses and no one to administer it.

The Chairman's suggestion was negatived, and the following proposed for consideration :—

That if rinderpest invades any of the territories adjoining German East Africa, the Governments of the territories more remotely concerned render them all veterinary assistance within their power, including contributions of serum.

After some discussion this was unanimously adopted.

Mr. Jones asked whether the Conference could offer any assistance to German East Africa.

Mr. Gray suggested that the previous resolution be communicated to the German East African authorities, and their attention directed to it in the event of their requiring assistance.

Mr. Stordy considered that should the German East African authorities wish veterinary assistance the South African Colonies should render it.

Mr. Jones said it appeared to him they were neglecting German East Africa. The territories represented at the Conference had to safeguard their own interests, but the first step he thought that should be taken was to supply assistants, etc., to the German authorities to try and prevent the disease spreading south of the Ruaha River.

Mr. Stordy proposed the following resolution :—

That until such time as German East Africa is able to supply the necessary amount of serum they should have prior claim to all the serum now available; and further, should the German East African Government desire additional veterinary assistance, that the South African States will do their best to assist them by seconding veterinary officers.

Mr. Gray thought this was going a wee bit too far. The proposal was to prevent the spread of disease, and they should not qualify the resolution by saying, "Until such time as German East Africa is able to supply the necessary amount of serum," etc. The resolution appeared to suggest that it did not matter whether the Germans were using the serum or not, and irrespective of the position in the South, their orders were to receive prior consideration.

Mr. Jones proposed the following amendment, seconded by Mr. Gray :—

That applications for serum from the German East Africa Administration to British East Africa receive prior consideration until such time as the former is in a position to supply its own requirements, or until the disease spreads beyond its borders.

Mr. Stordy withdrew his resolution, and the amendment was adopted.

The question of offering veterinary assistance to German East Africa was then raised, and the following recommendation was agreed to :—

That in the event of German East Africa requiring additional veterinary assistance for the purpose of combating rinderpest, the States represented at this Conference offer to assist by sending professional officers for duty in that territory.

Mr. Edmonds said that during his enquiry into this disease in German East Africa, he was greatly struck with one point, and that was the length of time the disease might exist before it was reported or diagnosed. In one place as many as 9,000 cattle had died before the disease was reported and inoculation commenced. Therefore, an early report was most essential in combating the disease. He would like to enquire what means the territories adjacent to German East Africa had of getting early reports and diagnoses of the disease; also whether it was advisable for them to make further provisions in order to get early information.

Mr. Garden said the remarks made by Mr. Edmonds applied specifically to Nyasaland. He believed Nyasaland was not in a position to expeditiously diagnose diseases, as there was only one veterinary officer, and he was stationed some 300 miles away from the point where they must watch for the disease to enter Nyasaland. The natives in the north of his territory were quite ready to report any sickness amongst their cattle, but by the time such a report would reach the veterinary officer, and before it could be acted upon, the outbreaks would have assumed considerable proportions.

Mr. Botelho, replying to the Chairman, said that as veterinary services were not established in the northern part of his Province, it was not possible for him to say whether any outbreak of rinderpest had occurred there. It did not, however, seem probable to him that the disease would pass to his territory, because the country to the south of German East Africa and to the north of Moçambique had large tsetse fly belts, where no bovines were to be found.

Mr. Chambers said they had moved all their cattle back 20 miles, and the district was patrolled, and any case of sickness was wired down to the veterinary surgeon, who diagnosed them. They proposed sending a man up to the border as soon as he arrived, and he thought it would be quite possible to render assistance to Nyasaland as they were so near.

Mr. Gray suggested they should recommend that the States adjacent to the infected area which were not sufficiently provided with a veterinary staff should strengthen their staffs without delay, and arrangements be made for stationing a man on the border.

The Chairman pointed out that in regard to the Nyasaland-Rhodesian borders, there were approximately 250 miles between the two lakes, and he thought it was essential that at least two veterinary surgeons should be stationed on each border; each man would then have 125 miles to look after. In his opinion, the greatest danger would be from the border between German East Africa and Nyasaland and North-Eastern Rhodesia. The Portuguese border, so far as he could see, was less menaced on account of the fly belts and the small number of cattle. Such veterinary officers would be of great assistance in the event of rinderpest approaching the border, and they should be supplied with proper facilities for the transmission of information to headquarters. The individual countries would, of course, supply their own veterinary officers.

Mr. Gray enquired how could Nyasaland hope to do anything to cope with the disease with only one veterinary officer.

After some discussion the following resolution was adopted :—

That on account of the vital importance of the early discovery of outbreaks of rinderpest, those States bordering German East Africa, which are insufficiently provided with veterinary assistance, strengthen their staff without delay, and that not less than two veterinary officers be stationed on the German East African border between Lakes Tanganyika and Nyasa, for the purpose of watching the situation.

The Conference desires to direct special attention to the dearth of veterinary surgeons in the Bechuanaland Protectorate, which places that territory at a great disadvantage and in a position of extreme danger should the disease extend further southwards.



Mr. Verney said he would like to point out to the representatives of the Administrations concerned the importance of giving veterinary officers an opportunity of gaining a thorough knowledge of the clinical symptoms and inoculation methods of handling this disease. Those States adjacent to the threatened area should lose no time in allowing their veterinary officers to become conversant with the disease. Those members of the Conference who had the unfortunate experience of the rinderpest in 1896 would probably not require to go through any training, but certainly for those who had not had such experience it was of the utmost importance that they should get it without delay. Even for those gentlemen who had had the experience, it was highly probable that, from the fact of the disease assuming the form it did to-day, the diagnosis was more difficult than it was in the outbreak of 1896. He proposed the following resolution :—

That States engaging new veterinary assistants, or whose present veterinary officers are not intimately acquainted with rinderpest, send officers to some centre where they can have the opportunity of studying the disease in its present manifestations.

This was seconded by Mr. Gray and carried unanimously.

Mr. Stordy said that should this resolution be adopted by any of the Governments represented, he would be more than pleased to place every facility in the way of any officers sent to British East Africa.

The Chairman proposed a vote of thanks to Mr. Stordy for his offer, which was carried unanimously.

The Chairman suggested that the Conference should now discuss the methods to be adopted in dealing with an outbreak of rinderpest.

Mr. Gray said that Mr. Edmonds in his report had stated that there were one or two lines of defence where they might be able to check the disease. Would it not be well to consider what steps should be taken at those points first? Their first hope was that the German authorities would arrest the spread of the disease at the Ruaha River by active immunisation of the cattle north of the river. They would also have to take steps to protect cattle on the south bank by giving them passive immunity. Failing the checking of the disease, the next step would be on the border of Northern Rhodesia, where there were European farmers. The best line there, if the disease came down through the native herds, would be to get the native herds immediately adjacent actively immunised, and at the same time to protect the farmers by giving their cattle passive immunity until such time as the infection passed off. After that, if they did not check the disease, the next hope would be the Zambesi River. There was, he considered, no other point where they were likely to have any chance of arresting the spread of the disease on account of the character of the country.

Mr. Stordy said the proposition of stamping out rinderpest in his territory was an extremely difficult one. The natives believed in infecting their herds when the disease came along. Their only chance of inoculation would be to have simultaneous inoculation, which was hardly practicable over such a huge area. The Masai method was to take a piece of the diseased meat or offal and pass it round to infect all their cattle with. They had carried out active immunity in herds, the property of two Europeans, and a high mortality followed the inoculation. He thought the mischief was due to the varying virulence of the blood used, and that considerable difficulty had been experienced in gauging the virulence of rinderpest blood. If they could standardise the blood, as they could the serum, it would be quite easy. Movement of trek oxen through some of the infected areas had been made possible by keeping the oxen under the influence of serum. This method had proved extremely useful and successful. Dealing with the natives was a very difficult matter.

The Chairman said that the measures to be adopted in case the disease crossed the borders of their territories were most important. Mr. Gray had suggested active immunisation of all their herds, and a belt round the infected areas to be passively immunised. In the event of a first out-



break, he did not think this could be improved upon. One thing to guard against was the double inoculation where the disease did not exist. He thought the active immunisation should be confined in the first instance to the actual and immediate vicinity of the outbreak. Mr. Robertson had brought up the question of bile. Bile, as a means of combating rinderpest, should not be lost sight of. There was always a possibility, in spite of everything they might do, of an outbreak assuming a more virulent form than in German East Africa, and if they had to begin operations at any time it would be very advisable to preserve the bile as they went along. He thought arrangements should be made to conserve the bile of all the cattle that died of rinderpest.

Mr. Robertson spoke very strongly in support of the conservation of bile. It could be kept almost indefinitely. He did not remember any infection definitely traced to the use of glycerinated bile after it had been kept for some time.

Mr. Gray said he did not know of any case in which the use of glycerinated bile disseminated disease. Fresh bile undoubtedly did communicate the disease, and the use of fresh bile was to be deprecated. The immunity conferred by glycerinated bile was less than that of fresh bile, but it was safer, and it would be a great mistake to overlook the desirability of collecting bile if any of them had the opportunity of so doing. It kept from  $2\frac{1}{2}$  to 3 years. The question of dealing with an outbreak of rinderpest had been discussed at a Conference held some years ago at Bloemfontein, and the general view was that if they got an isolated outbreak in any territory, the best way to stamp it out was by the use of serum, and serum alone; immunise all the cattle surrounding the area with serum, and destroy the infected cattle in the centre. In that way they would finish the outbreak completely. In the last outbreak in Rhodesia, which he handled, they stamped it out by the use of serum, and serum only. Have the animals killed and the others immunised, and a fortnight was sufficient for the veld infection to disappear.

Mr. Stordy said that, apropos of Mr. Gray's remarks, he had never attempted to destroy cattle in his territory, as it would cause trouble amongst the Masai at once.

Mr. Gray said that if they could do nothing else, and where, for native reasons, it might be inexpedient to destroy cattle, they could simply inoculate all the cattle in the herd with plain bile. By inoculating with fresh bile, those who got the disease died, but others which got active immunity preserved that immunity for a very long time.

Mr. Chambers raised the question of whether the infection could be carried by vultures. He had seen vultures bury themselves in dead cattle, and emerge covered with blood, after which they flew several miles and bathed in pools where cattle subsequently drank.

Mr. Stordy considered that the rapid drying of the blood would be enough to prevent infection.

Mr. Robertson said that in 1896 he was one of Koch's assistants, and at the time one of the things that attracted farmers was the possibility of the spread of the disease by vultures. Experiments were carried out with vultures, which proved conclusively that the disease could not be carried by these birds. They failed to inoculate with the feathers round the beak, which were soaked in blood, or with meat that had been in the stomach for eight hours. Professor Koch's dictum was that the birds could not in any way spread the disease.

Mr. Gray said that during the last outbreak, virulent blood was sent up from Kimberley through the medium of sheep, which travelled to Vryburg by train and from thence by coach. They were pretty well able to depend upon the virulence of the blood, and he thought possibly the difficulty Mr. Stordy had experienced in the difference of the virulence of the blood was due not so much to the variation of the blood as to the variation of the susceptibility of the animals inoculated.

Mr. Stordy said he did not think this could account for it. In the case referred to, it was a half-bred which had been inoculated, and the mortality had run so high that further inoculation had been postponed until such time as laboratory experiment had demonstrated the best method of transporting virulent material.

Mr. Gray proposed the following resolution, which was seconded by Mr. Robertson, and carried unanimously :—

That if an outbreak of rinderpest is localised in extent and serum is not immediately obtainable, the infected animals and all those in contact be destroyed; but if serum is available, only those actually suffering from the disease should be killed, and those in contact injected with large doses of serum, while the adjoining herds are treated in a similar manner.

If the outbreak be extensive, or destruction inadvisable, virulent blood and serum or fresh bile should be employed for the inoculation of infected herds, and the surrounding herds passively immunised with serum or glycerinated bile.

No opportunity should be lost of preserving in glycerine all rinderpest bile for use in cases of emergency where serum is not available.

Mr. Edmonds, in introducing the question of controlling the use of virulent rinderpest material, such as blood and bile, pointed out that in territories where there were European farmers and traders, they also had their opinions as to the methods of combating the disease. In a country, for instance, like Nyasaland it would be very dangerous to have men going round with bile or any other material for the treatment of rinderpest.

Mr. Gray said it was advisable in those territories that steps should be taken to see that proper regulations were drawn up with as little delay as possible. It was not always easy to get the regulations carried out; still, if they had the regulations they had a remedy against offenders, which they had not if there were no regulations. He considered that inoculation with virulent material should be prohibited, except by express permission of the veterinary authorities, and under their supervision. It might be necessary to employ lay inoculators if the outbreak got out of hand to any extent.

The following resolution, proposed by Mr. Edmonds and seconded by Mr. Chambers, was carried unanimously :—

In all territories in which regulations are not in force prohibiting the unauthorised use or removal of blood, bile, or any other material liable to convey rinderpest, such regulations be promulgated without delay.

Mr. Edmonds referred to the question of combating the disease on the border, and said he would like to hear a little more about what was being done in Northern Rhodesia to prevent the entry of the disease.

Mr. Gray pointed out that there was a strip along the Nyasaland border where no steps had been taken at all.

Mr. Garden said it would be quite possible to have a belt cleared of cattle on the northern border of the Nyasaland Protectorate, and before he left Zomba, steps had been taken with this end in view. So far as the natives were concerned, they were very amenable.

The Chairman said that they must admit that a 20-mile belt was not an effective barrier, but at the same time with such a belt it would be impossible for the disease to cross the line at a number of different points. If the disease were introduced at one or two points only, it would be easier dealt with than if a general infection occurred all along the border.

Mr. Jones raised the question of the advisability of taking any steps to control the movement of natives, to which Mr. Gray replied that while great good might come from controlling the movements of stock, the stopping of movement of natives was altogether outside practical politics.

Mr. Chambers pointed out that on the German border there were certain ports of entry, through which the native could only come in.



Mr. Stordy said that in his territory they had found the natives very difficult to deal with; they had tried various means to check the movement of cattle, and it was found the native got the better of them every time.

The Chairman said that so far as his territory was concerned, he had found the natives very amenable to the regulations; perhaps in Mr. Stordy's territory they were more difficult to deal with. In any case they should make an effort to enforce the regulations.

Mr. Chase proposed the following resolution, which was seconded by Mr. Gray, and carried unanimously :—

That the Nyasaland Administration establish a cattle-free belt along the German East Africa border, similar to that which is being cleared in Northern Rhodesia, and that joint arrangements be made by these Administrations for the patrolling of the belt, the approximate length of which is 250 miles.

The question of establishing a station for the production of rinderpest serum in the event of the disease extending to Northern Rhodesia and threatening the territories to the south was discussed. The following resolution, proposed by Mr. Gray and seconded by Mr. Edmonds, was adopted :—

That in the event of the disease invading Northern Rhodesia in spite of the efforts made to arrest its spread and before reserves of serum have been furnished by the British East Africa Administration, immediate arrangements be made for the establishment of a serum station at some point in proximity to the railway in Northern Rhodesia, and the Government which is in the best position to supply staff and equipment for such a station undertake its management.

The Conference then proceeded to draft a minute covering the resolutions, and arrange them in the most suitable order.

#### AFRICAN COAST FEVER.

*Dipping.*—At the request of the Chairman, Mr. Gray opened a discussion on African Coast Fever. Mr. Gray said he thought the best he could do would, in the first place, be to detail briefly the position in the Union so far as African Coast Fever was concerned. To begin with, he would refer to the policy that had been adopted in dealing with this disease. Previous to his arrival in the Transvaal, the methods in force consisted of stamping out the disease by means of slaughter, by fencing infected areas, controlling the movements of stock, and quarantining infected veld for a period of fifteen months from the date of the last case. These were the sheet anchors of the methods in force. Needless to state, fencing cost a considerable amount of money, and even then it was not effective. The restrictions imposed on the movement of stock only referred to bovines and not to equines. This policy was adhered to until the short-interval dipping system was discovered by Col. Watkins-Pitchford, and as a result of the adoption of short-interval dipping, combined with the fencing, the disease had been banished, except in one or two areas largely occupied by natives, and even there it was fast disappearing. In the Zoutpansberg district when he went to the Transvaal there were about 60 active outbreaks of African Coast Fever; now there were about six, and all these areas were fenced with one exception, and at that place they had cattle concentrated and dipped at three-day intervals. The most extensively infected area in the Transvaal was formerly the district of Zoutpansberg, where there had been at one time something like 150 centres of infection. The number of infected areas in that district had been reduced to seven, on all of which, with the exception of two, dipping tanks were erected and in use. At the two areas in which there were no dipping tanks the cattle had been inoculated, and susceptible calves were killed immediately after birth in order to prevent the re-infection of the veld, so that the position in this district was entirely satisfactory.



The next district in which there was any disease at all was Carolina, where there had not been a fresh outbreak for eight months. All the infected centres there were dealt with by the transfer of stock to concentration camps or by slaughter—mainly by slaughter. In the Middelburg district, where the disease was once prevalent, it had disappeared. About the only district where there was any serious development at the present time was Piet Retief, on the Swaziland border. The residents there were chiefly poor Dutch farmers of a non-progressive class, who always objected to conform to the regulations. Now, however, dipping tanks were being erected, and they hoped to have the disease in hand in the course of the next ten or twelve months. They had still two centres of infection in the Western Transvaal. One was at Rustenburg, and the other in a small area adjoining the town lands of Pretoria. At Rustenburg there had only been one death in nine months. There was a dipping tank there now. In this area there had been one solitary case, and no one could explain where the infection came from. In the Pretoria outbreak the experience was similar. A young animal died there about ten months ago. No other animal had died. The area had been fenced now, and the people were cleaning their cattle to the best of their ability, although there was no dipping. That represented the position in the Transvaal, and he thought that was exceedingly satisfactory. (Hear, hear.) Passing from there to Natal, the position in that colony, previous to the Union and previous to the native rebellion in Zululand, was very promising indeed. The Veterinary Department had the disease well in hand, and were then working the temperature camp system. As a result of the rebellion, loot cattle were taken from Zululand and, against the advice of the veterinary authorities, sold by public auction at Maritzburg and Durban, with the consequence that the disease broke out all over the place. Wherever these cattle went to the disease broke out. Transport oxen were also allowed to come back from Zululand, and they, too, carried infection, so that the result was most disastrous. Then, to make matters worse, the Natal Government saw fit to reduce the veterinary establishment on the recommendation of the Minister for Agriculture, who announced that he had the disease by the throat. The reverse proved to be the case, and since then no satisfactory work was done in Natal until the inception of the short-interval dipping system inaugurated by Col. Watkins-Pitchford; afterwards the energies of the farmers had been directed to saving their stock by dipping on the lines indicated by Pitchford. Previously, although the desirability of killing the ticks was recognised and advocated by many, the attempts made did not entirely succeed in clearing the farms of ticks. Mr. Joseph Baynes, a dipping pioneer who pinned his faith on dipping, got the disease on his own farm in spite of the fact that he had been dipping his cattle for four or five years, and was not able to get rid of it until he resorted to short-interval dipping. After that was discovered, people regained confidence. Dipping tanks went up on every side, and the results, taken all round, had been very satisfactory indeed. A large area of Natal was now free from infection, and although there was as yet no magisterial division there entirely clear of infection, large areas had been cleared by dipping, and the position had steadily improved. The only point he was a little apprehensive of was that farmers now appeared not to fear African Coast Fever enough. Some farmers did not dip with sufficient care to ensure the eradication of ticks, and it looked as though there was some risk of the disease establishing itself in an endemic form. What he was now endeavouring to do was to arrange for more thorough supervision in connection with dipping operations. Another serious difficulty from which farmers in Natal had suffered was the presence of native locations in the midst of the farming community, the majority of which were infected. The natives made no serious effort to eradicate the disease, and farmers adjoining these locations complained of the danger to which they were exposed by the presence of these neglected centres of infection in their midst. Now, however, the Government was erecting dipping tanks in these areas, and he had no doubt their use would be attended with good results. Proceeding, Mr. Gray said stock inspectors had been instructed to see that animals were kept free of ticks, and to give personal attention to the dipping of animals. Another difficulty farmers had to contend with in Natal was the considerable number of absentee landlords, but during the

present session the Government proposed to introduce legislation by which absentee owners would be compelled to erect dipping tanks should an outbreak of African Coast Fever occur on their property. The tenants of such properties would also be compelled to dip their cattle, and for the purpose of erecting such tanks advances will be made by the Government. For many years in Natal all movement of cattle for transport purposes was prohibited, but now, since areas were becoming clean, special privileges had been granted to farmers who have dipping tanks on their farms and were dipping their cattle regularly. Passing from Natal to the native territories, he would say the position was more serious. When the disease invaded the native territories from Natal, a vigorous attempt was made to check it by slaughter, but that attempt failed. When the disease became rampant, the Chief Magistrate, who had seen something of the benefits of dipping in Natal, was very anxious to introduce dipping or spraying. Personally, he (Mr. Gray) had very little hope of checking it in that way on account of the local conditions obtaining in the native territory, which was densely occupied by cattle, whose grazing areas overlapped, a state of affairs which made it almost impossible to check the spread of the disease by dipping. However, the Chief Magistrate pressed the point, and suggested the erection of dipping tanks and the obtaining of spraying machines. This was done, but, of course, they were not able to build tanks to keep pace with the spread of the disease. In several places where these facilities were provided early the disease was checked, but unfortunately the Native Council ran out of funds, and operations were restricted. Things went from bad to worse, and no good result attended dipping operations under these conditions. After that had failed, Dr. Theiler, who had devised a method of inoculation against African Coast Fever, was rather anxious that a trial should be made of his immunising method. He (Mr. Gray) was not too keen about the proposal, because he realised that the immunisation of cattle meant increasing the risk of perpetuating veld infection. However, they gave the method a trial, and gentlemen present would have some idea of the magnitude of the work undertaken by the officers of the division when he mentioned that in the Transkei some 192,000 head of cattle had already been inoculated. There was still a lot of work to be done in the Transkei. The disease spread from the Transkei to the border districts of East London and Kingwilliamstown in the Cape Province, about a year ago. When the disease broke out the European community as a whole responded, under pressure, to the recommendations of the Department by erecting dipping tanks, and the results had been fairly satisfactory, except in Ward 7 adjoining the Transkei. Mr. Gray went on to explain that in this area there was a good deal of land which had been granted by Sir George Grey to the German Legion, and that the land having got into the hands of impoverished owners, it was very difficult to deal with the matter.

Mr. Elder said that Swaziland, where he was engaged, was a native territory, and in dealing with natives the controlling of movement of stock was very difficult. Up to four years ago they were unable to do very much towards checking the spread of African Coast Fever, principally owing to the lack of funds, and not having the full confidence of the natives. Three years ago, as the commencement of a system of control, they branded all the cattle in the country. He might mention that the kraals of the natives were dotted about all over the country, and this made it very difficult to control the movement of stock. They branded the cattle with separate brands, and this stopped the illegal movement of cattle. They also attempted to establish concentration camps, but these camps were not a success. When short-interval dipping became possible and it was decided to commence dipping, ways and means had to be devised for raising funds to carry it out. A tax was, therefore, imposed of 2s. per annum per head of cattle owned by Europeans in the country, and 2s. per annum upon each adult native in the country. This brought in about £3,000 a year, and to this the Government contributed a large amount. Out of the sum so raised dipping tanks were erected, and it was made compulsory for all cattle within six miles of a dipping tank to be dipped regularly. All dipping was free, and all tanks were under the supervision of the Government. Upon an out-



break of disease being reported, a stock inspector or himself visited the scene of the outbreak and took control of all cattle there. All the cattle that died after control had been taken were paid for, but compensation was not paid in regard to animals that died before the outbreak was notified. This system encouraged the natives to report outbreaks, and this had been of great assistance to the veterinary staff. They were now dipping all the infected herds every three days, and all herds in the neighbourhood of infected areas were being dipped at five-day intervals. They had eighteen dipping tanks in the country in operation, and hoped within the next twelve months to build another ten. All these were under Government supervision, and all cattle within six miles had to be dipped regularly. During the period from September, 1912, to February, 1913, no outbreaks were reported, but during March this year three outbreaks had occurred which could not be accounted for. They were erecting dipping tanks in these places so that they could dip cattle in contact with the infected herds. It was the exception for cattle to die of African Coast Fever where dipping was in force. In some parts of the territory dipping had been carried out for over two years.

Mr. Botelho explained that, in the Province of Moçambique, veterinary officers were only established in the Lourenço Marques district. All cattle in areas infected with African Coast Fever were slaughtered at municipal abattoirs in Lourenço Marques. All the infected circumscriptions were now free of disease except one (Chibuto), where it had re-appeared. In this circumscription there were some 500 head of cattle. No movement of stock was allowed, and all infected animals were immediately slaughtered. Although there were no veterinary services established in the northern districts of Moçambique, one officer had been sent to the Inhambane district to see if there were any symptoms of the disease there, and to study the best means of establishing veterinary services there. Up till now they had not been able to erect a sufficient number of dipping tanks in the territory, but in the estimate for the current year the sum of £10,000 had been voted, and he hoped very soon an adequate number would be built. (Applause.)

Mr. Sinclair said he thought they could congratulate Mr. Gray with regard to the general position in the Transvaal. He also wished to congratulate Mr. Botelho on the very satisfactory position in Portuguese East Africa. He would follow the line adopted by Mr. Gray, and give a short review of the position in regard to African Coast Fever in Rhodesia. Generally, the procedure was very similar to that described in the Transvaal. Originally they quarantined and stopped the movement of cattle all over the country. Practically the first attempt made to eliminate the disease was on the various commonages. After the disease had passed through the country a certain number of salted animals were left on these commonages. The first step in dealing with these cattle was to compel the owners to stable the calves, and as soon as these were weaned they were taken out to clean veld on a wagon. Several hundred calves were moved in the first twelve months, and they did not in a single instance convey Coast Fever to the clean veld. In several cases calves contracted the disease while stabled. Whether this was due to infection in the stable or whether infected ticks were carried in by means of grass, it was difficult to say, but in one case at least he was positive the disease was conveyed to the stabled animals by the medium of hay. From that stage they passed to the temperature camp method. Generally speaking, this method had proved successful. Sometimes the mortality was very high, and at other times it was very low. Their efforts were so successful that in 1907 they went for eleven months in Rhodesia with a solitary case of African Coast Fever. Fortunately they had now a valuable adjunct to the temperature camp method in the three-day dipping system, and he thought it should be put on record what they owed to Col. Watkins-Pitchford for his work in that connection. He (the speaker) thought the system of short-interval dipping had solved the problem of Coast Fever. It might take considerable time to absolutely eradicate infection, especially in the native territories, but he thought that eventually three-day dipping would conquer African Coast Fever. At the present time the position in Rhodesia was very satisfactory. During the last year the disease existed at ten centres. Through three-day



dipping, and in some cases by the removal of cattle from the infected veld, satisfactory progress has been made in controlling infection and towards eradicating it. In Umtali district there was one infected area, viz., the Commonage. It was thought that the disease had been eradicated in this district, but in January, 1911, an outbreak occurred in a dairy herd on the Commonage. Fortunately a dipping tank existed; weekly dipping had been regularly carried out for a long time prior to the outbreak; three-day dipping was immediately resorted to, and during 1911 one more case occurred. In both cases the affected animals were young calves. In 1912 two more cases occurred, also with calves, the latter of which was in April. Shortly, the position in regard to Umtali district was as follows:—There was one infected centre, on which no disease had occurred during the last twelve months. The next infected centre was the Salisbury Commonage. In February last year (1912), after nearly two years' freedom, a case was discovered in a dairy herd. Again a dipping tank had been in weekly use for a considerable period prior to the outbreak, and upon this case occurring three-day dipping was at once begun. A second case occurred in June, but since then there had not been another. In both instances, viz., the outbreak on Salisbury and Umtali Commonages, the herds in which the disease appeared had not been removed from the infected veld. Another centre existed in the Salisbury district, viz., on the farm The Grange, about eight miles east of the township. On the 31st December last the owner brought into the laboratory the heart and lung of a young calf. Microscopic examination shewed that the cause of death was acute redwater. One of the veterinary staff was sent out to inspect, as the owner said several calves were ill. On examination, a calf about six weeks old was seen to have enormously enlarged glands below the ears; these were punctured and smears taken, examination of which shewed Koch's bodies in large numbers. As he (the speaker) was interested in the case, the calf was isolated for observation, smears were taken daily, but at no time was the presence of piroplasma demonstrated in the blood. The animal died on the fourth day, and *post-mortem* examination revealed a most extraordinary enlargement of all the lymphatic glands and spleen. Smears taken at this examination shewed Koch's bodies in enormous numbers in the spleen and glands, but piroplasma were still absent from the red cells. Pending the erection of a dipping tank, the herd is sprayed every third day, and particular attention paid to the ears, which are hand-dressed weekly. No further cases have occurred to date. In Matabeleland there were eight centres of infection, all within a radius of 25 miles of Bulawayo. On four of these no case of disease had occurred during the last twelve months; at three centres it was 11, 10 and 7 months respectively since the last death from Coast Fever. Three-day dipping was being regularly practised, not only with the infected herds, but with all the adjoining herds. In fact, over 30,000 head of stock in and around these infected centres were being regularly dipped. There was only one centre, viz., the farm Collaton, about sixteen miles south-west of Bulawayo, where infection was now active. The disease was discovered at this centre a little more than a year ago, and had evidently existed for a considerable period. About 1,000 head of native cattle were immediately involved, and there were large numbers of animals, both European and native, in the vicinity. Unfortunately there was no dipping tank, and all the cattle concerned had to water at the same place. There was no clean veld available to which they could be moved to a temperature camp. The farm was immediately fenced, and this, with the close supervision of the cattle, prevented the outward spread of infection. Three-day spraying was carried out, but with such a large number of cattle and gross infection this was of little use. It was not until the last week in June that the dipping tank was ready for use, and at that date the mortality was about 350 head; this included animals that died from Coast Fever and those that were destroyed on shewing a rise of temperature. Immediately three-day dipping was started there was a most marked decrease in the mortality. In the following four months the deaths were:—July, 19; August, 20; September, 20; and October, 3; and since 1st November there had only been five cases. Continuing, Mr. Sinclair said that Mr. Gray, in referring to dipping, had expressed the opinion that over-

confidence in dipping might lead to serious trouble. He (Mr. Sinclair) quite agreed with him, and although they in Rhodesia were in a very satisfactory position to-day through the general application of dipping in and around infected areas, it was quite possible that infection might be masked, and that possibly in the next year or two cases may crop up unexpectedly. However, he thought dipping was the solution of African Coast Fever, and would like to see it practised generally in this country, but that was impossible under the present conditions. The Union, he observed, were enforcing the erection of dipping tanks on land belonging to absentee landlords. In Rhodesia there were a lot of farms owned by Europeans, who lived elsewhere and employed agents here to collect the rent from the native tenants. It was a difficult matter when they thought about compulsory dipping in such cases as these, as they could not expect the native to pay for the erection of the dipping tank. A measure had been passed at a special session of the Legislative Council which provided, amongst other things, that if the erection of a fence or dipping tank or other structures necessary for dealing with African Coast Fever were required, the Administration could proceed with the work and charge the amount expended against the land. During the last four or five years the Rhodesian Administration had spent an enormous amount of money on fencing and dipping tanks as a means of preventing the spread of African Coast Fever. Proceeding, Mr. Sinclair said that if a man had his farm fenced and a dipping tank erected, he need not fear Coast Fever. Referring to public dipping tanks, he said there was a large number throughout the country. Public dipping tanks were useful, but he doubted if they were worth the money spent on them, and he would prefer to see the money applied towards the encouragement of dipping by individual owners of cattle.

Mr. Stordy said that, regarding African Coast Fever in British East Africa, he was of opinion it had been there for a good many years. That was proved without doubt by the large tracts of country which were looked upon and known to be endemic areas of Coast Fever. The Masai were probably the largest owners of cattle in British East Africa, and there was no doubt they had known Coast Fever for centuries. They also found that by moving their stock they reduced the mortality in their herds. Proceeding, Mr. Stordy said that all cattle movement was regulated by permit. They insisted that cattle should be eighteen months to two years old before they might be brought from endemic areas. No calves were allowed out. These cattle are then placed in an area slightly infected by the introduction of susceptible cattle, and if they survive for a period of six weeks or two months they were specially branded and granted permission to trek throughout the country. This system had worked exceptionally well. With regard to native reserves, they had ports of exit for natives to bring their cattle, but they did not always hold to these ports. In conclusion, Mr. Stordy mentioned that one of his reasons for coming south, apart from attending the Conference, was to enquire into the methods of dipping in South Africa, for it was hoped to promulgate some regulations of the same kind in British East Africa. He did not think fencing was practicable in that territory owing to the size of the farms there.

*(To be continued.)*

## Correspondence.

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### LIVE STOCK INSURANCE.

To the Editor,

*Rhodesia Agricultural Journal.*

Sir,

Perhaps, through the medium of the *Agricultural Journal*, the opinion of Rhodesian farmers might be obtained as to the practicability of establishing a mutual insurance society to compensate for losses in cattle.

I recently inaugurated such a system for horses at Roberts Heights, and it was, of course, on a much smaller scale than would be required in Rhodesia even if the system were applied separately to districts. It appears to me that with such a central organisation as the B.S.A. Company, whose interests are our interests, such a scheme might be a benefit to Rhodesia generally.

The system roughly is this:—Save large profits made by insurance companies, and keep the money in the country, and let it, when occasion arises, be given back to subscribers, as shareholders. The rules for the pony insurance club were very simple. Each individual registered the number of his polo ponies, and in case of death of any one pony he was liable, when death occurred, for a share of the value (such value was limited) of such animal according to the number of ponies he himself registered. A £21 pony recently killed at polo worked out at 6 per cent. as the share of a man with one pony.

I think that for cattle a subscription paid in advance for, say, each ten head of cattle owned would have to be made. The money might be invested and given back to subscribers.

I think animals should only be insured for past value, and rules as to dipping and proper care of animals enforced.



It would perhaps be better to divide into districts, as a man who has selected what he may consider a healthy district would not be agreeable to share the losses in a district of which he did not approve.

The main object of this letter is to see if anyone favours the system of insurance and keeping the profits made by companies among Rhodesian farmers—in my opinion two desirable objects.

Yours, etc.,

C. W. GREY, Lt.-Colonel.

Glenavon,

Insiza.

*P.S.*—I would suggest that, to begin with, bulls be insured for two-thirds of their value, and that two classes be made, *i.e.*, (1) for imported beasts, (2) for South African bred beasts.

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### BRICKMAKING.

To the Editor,

*Rhodesia Agricultural Journal.*

Sir,

I read with much pleasure the hints on brickmaking in your October Journal. But is not Mr. G. T. Dyke going to a lot of unnecessary expense in making same? I have made bricks in England and in this country, and there is a vast difference. I take it that a farmer does not want a terra-cotta brick, but one that will stand the weather with the least expense. Take, for instance, Mr. G. T. Dyke's table and tanks. The table can be made of poles, with packing cases for a top, but I consider this is not required. All there is to do is to dig a pit for the moulder to stand in, with a small hole alongside to wash the moulds. Line the moulds with tin (old biscuit tins cut up). This will keep the bricks from sticking and requires no sand.

The ground can be got on any farm. Take the ordinary black vlei soil, and you will generally find clay enough in it to make bricks, or the red soil is also good. (See that there is no

lime in the soil, or the bricks will fly when put into water.) Get an old cement drum, cut a hole 6 in. x 4 in. at the bottom, put a wood shaft with knives bolted on in the centre of it, then a 12 ft. pole made fast to the shaft, and you have a pug mill that one boy can turn. The moulder has his pit at the outlet of pug, and takes clay direct from it, thus saving boys puddling clay and throwing on table. With eight boys one moulder should turn out from 1,000 to 1,500 bricks per day. Regarding the burning, I think a flue from end to end is best for wood burning; you can then fire from both ends. Fill the flue with dry wood before finishing the arch, and then fire with green wood. The fire should be through in 24 hours, and you can tell by throwing dry grass on top. If it is through in one place, throw sand on to drive the fire out all over. When that is finished, close up the doors with green bricks and cover the top with sand about 2 in. thick. The bricks will take three weeks or more to cool. If any reader wishes any other information I can give, I shall be pleased to do so if written to on the matter.

Yours, etc.,

HARRY S. GAMMON.

The clamp will require a 9 in. green brick wall to the top of arch, then 4½ ft. to the top, well dagga'd up, to prevent fire escaping.

Ellavale, Odzi,

12th October, 1913.

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[A makeshift, any sort of style, and "anything-will-do method," is a sure cause of failure with brickmaking, as with anything else. When a man is putting up a permanent building, surely it is worth while giving a little extra time to the making of the bricks. As for black vlei soil and red soil, I would never advise their use.—G.T.D.]

## Veterinary Report.

September, 1913.

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### SALISBURY.

AFRICAN COAST FEVER.—*Existing Outbreaks.*—On the Hatfield Estate infected area, six infected animals were destroyed.

*Fresh Outbreaks.*—On the 13th September the disease was discovered in a small herd on the Hillside section of the Salisbury commonage. Two animals were affected. In both cases the existence of the disease was demonstrated by *post-mortem* and microscopic examinations. On the 25th September the death of an ox on the farm Hayden was reported. *Post-mortem* and microscopic examination shewed that death was caused by Coast Fever. The source of infection in this case is inexplicable, but I am inclined to the view that it was due to the persistence of tick life beyond the average period. In January, 1911, a severe outbreak occurred on this farm, and the whole herd was immediately destroyed. No cattle were allowed on it until August, 1912, that is 19 months. For re-stocking purposes, cattle were obtained from various clean districts. Had the infection been introduced by any of these there would have been evidence of it within a month of their arrival. It is possible that infection was carried from the Hatfield centre, about sixteen miles distant, but it is improbable, as there have been no movements of cattle to or through Hayden from anywhere near Hatfield during the last twelve months. The average period in which veld becomes clean after the last case of disease is about twelve months. This, however, cannot be regarded as the maximum life of the tick. It is the period in which a crop of infected ticks become innocuous by feeding on other animals or disappear through various destructive agencies. There is no reason to suppose that a tick may not in some cases have a period of life much beyond the average, given favourable conditions.



**TUBERCULIN TEST.**—The following animals, imported from England, were tested, with negative results:—Mr. Rogers, 2 Hereford bulls; Capt. Paulet and others, 8 North Devon bulls and 5 North Devon heifers.

**REDWATER AND GALLSICKNESS INOCULATION.**—Thirty-five bulls and heifers imported by the Department of Agriculture from England were inoculated.

The six Hereford bulls and six Hereford heifers belonging to the Hunyani Tobacco Plantations and the Amalgamated Properties, Limited, shewed marked reaction to both Redwater and Gallsickness, and recovered without any fatalities.

The Sussex cow obtained from the Bacteriological Laboratory, Pretoria, several years ago for the purpose of supplying virus for inoculation for these diseases was inoculated with local virus and succumbed after a severe attack of anaplasmosis. The results of former experiments shewed that the immunity conferred by the blood of this cow was not sufficient to protect against the local type of Gallsickness. It is not surprising, therefore, that she reacted severely and succumbed to the inoculation of local virus.

**SPIROCHAETOSIS.**—Smears from a heifer calf belonging to Mrs. Krienke, Salisbury, shewed Spirochaetes.

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## BULAWAYO.

**AFRICAN COAST FEVER.**—No fresh cases at the existing centre of infection at Collaton.

**MALLEIN TEST.**—The following animals were tested on importation, with negative results (includes Gwanda and Plumtree):—Horses, 99; mules, 89; donkeys, 134.

**HORSE-SICKNESS INOCULATION.**—Fourteen mules inoculated. No deaths.

**IMPORTATIONS.**—Heifers, 644; heifers (English), 10; bulls, 70; bulls (English), 15; sheep and goats, 4,958; eight over-age heifers were destroyed.

**TUBERCULIN TEST.**—One bull and five heifers imported from England were tested, with negative results.

## UMTALI.

AFRICAN COAST FEVER.—*Existing Outbreak.*—Eight head were destroyed at N'Odzi, bringing the total mortality to date to 106.

WIREWORM IN SHEEP.—A number of sheep died from this affection at the Land Settlement Farm.

IMPORTATION OF POULTRY.—Sixteen crates of poultry were examined on entry from Portuguese East Africa. Two crates containing diseased fowls were refused admission.

MALLEIN TEST.—Three horses tested, with negative results.

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HARTLEY.

TRYPANOSOMIASIS.—Two oxen affected with this disease (fly struck) were slaughtered.

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No infective disease reported from any of the other districts.

J. M. SINCLAIR,

Chief Veterinary Surgeon.

# Veterinary Report.

October, 1913.

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## SALISBURY.

AFRICAN COAST FEVER.—At the Hatfield Estate centre eight infected animals were destroyed.

No fresh cases at the other infected centres, viz., the Commonage, and the farms Grange and Hayden.

TUBERCULIN TEST.—Ten bulls imported from England by Mr. H. Williams, of Changwe Ranche, for himself and other farmers, were tested, with negative results.

REDWATER AND GALLSICKNESS INOCULATION.—A very heavy mortality resulted from the effects of inoculation in the English bulls and heifers imported by the Department of Agriculture for distribution to farmers. Out of the 35 head treated 15 succumbed. These unfortunate results are mainly due to the oppressively hot weather which obtained whilst the animals were suffering from the Gallsickness reactions.

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## BULAWAYO.

AFRICAN COAST FEVER.—No fresh cases at the only existing centre of infection in Matabeleland, viz., Collaton.

MALLEIN TEST.—The following animals were tested on importation, with negative results (including Plumtree and Gwanda):—Horses, 52; mules, 22; donkeys, 82.

HORSE-SICKNESS INOCULATION.—Six mules inoculated. One death.

IMPORTATIONS.—Heifers (Colonial), 108; bulls (Colonial), 49; bulls (English), 14; sheep and goats, 6,062. Three Colonial over-age heifers destroyed.

TUBERCULIN TEST.—One English bull gave a suspicious reaction, and will be re-tested at a later date.



## UMTALI.

AFRICAN COAST FEVER.—*Existing Outbreak.*—At the farm N'Odzi, nine head were destroyed on rise of temperature, bringing the total mortality to 115.

*Fresh Outbreaks.*—On the 10th October a beast was reported ill on the farm Mabonda. Microscopic examination shewed the presence of Koch's bodies. The animal was destroyed, and on *post-mortem* examination the existence of Coast Fever was confirmed. There are upwards of 400 head on the farm. The herd in which this case occurred consists of 92 head. These have been removed to clean veld. Three-day dipping has been practised on this farm since May last, and it is not anticipated that there will be any serious mortality or spread of infection.

On the 27th October smears were taken at Mr. Jarvis' request from some cattle brought to his farm from N'Odzi fourteen months previously. In a calf born three weeks after the arrival of the animals from N'Odzi one Koch's body was found, and in a second lot of smears another one was discovered. The calf was isolated, and the temperature taken daily, but no febrile symptoms were shewn. Subsequently it was destroyed, but the *post-mortem* shewed no signs of disease.

QUARTER EVIL (Symptomatic Anthrax).—A yearling bull died from this disease on the farm Devonshire, and is the first case recorded in Umtali district.

SCAB.—An outbreak in a herd of goats at Imbeza valley was dealt with. The owner was convicted and fined £5 for failing to report the outbreak.

POULTRY.—Eight crates of fowls *ex* Portuguese East Africa were examined on arrival at Umtali. Five were refused entry on account of disease.

## MELSETTER.

Several animals in a lot of Colonial heifers contracted Redwater and Gallsickness, three of which died.

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VICTORIA.

HORSE-SICKNESS INOCULATION.—Twenty mules inoculated.  
Process not yet completed.

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All other districts reported free from infective disease.

J. M. SINCLAIR,

Chief Veterinary Surgeon.

## The Agricultural Outlook.

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Practically all the districts of the Territory have been favoured with early rains, and in some parts the rainfall has been sufficient to induce farmers to plant their maize crop. In most places, however, farmers have contented themselves with breaking up their lands pending the permanent setting in of the rains, which is now expected daily. Throughout the country there has been a very welcome diminution of grass fires, and for the time of the year the grazing is particularly good. Many farmers, it is pleasing to note, have not during the past season relied entirely upon veld feeding, but have made provision in the way of ensilage, etc., and in consequence the rigours of the dry season have had little terror for them. Stock have everywhere wintered particularly well, and except for a few sporadic outbreaks of Coast Fever, kept well under control by short-interval dipping, are remarkably free from disease. Many farmers at Marandellas have planted their tobacco, but rain is wanted to bring the crop on.

Three or four inches of rain have fallen in the Umzingwane district, and the general outlook there is excellent. Mr. Aserman, at Heany Junction, is using a steam plough, the third now in operation in Rhodesia, and it is reported to be doing good work.



# Garden Calendar.

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By N. L. KAYE-EDDIE.

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## THE FLOWER GARDEN.

*December.*—This month is generally showery, and constant stirring of the soil is, therefore, necessary to keep it loose. Seeds of perennials and annuals for February blooms may be sown. Transplanting should be done in the evening on a cloudy day. Carnations should be kept free from dead wood, and climbers attended to.

*January.*—This month requires all one's energy in the flower garden. Annuals may still be sown for late flowering before the season is over. Planting out should be done as early as the weather permits, and advantage taken of a dull day after a shower for this work. If care be exercised much smaller plants may be put out than would at first be thought advisable, as with attention these will make stronger plants than larger ones, which are more likely to receive a check. The soil requires constant stirring, owing to the packing caused by the rains and for the eradication of weeds, which are now very troublesome. All plants should be kept free of dead and decaying matter.

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## THE VEGETABLE GARDEN.

*December.*—All vegetable seeds may be planted. All advanced plants should be constantly cultivated. Potatoes should be ridged, and peas, beans and tomatoes staked. This is a good month for planting the main crop of potatoes.

*January.*—Turnips, carrots, cabbage, lettuce, etc., may be sown for carrying on during the winter months. Potatoes may be planted this month for keeping through the winter. Weeding and cultivating between the rows should be continually carried on.

## Market Reports.

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The produce market in Salisbury is well supplied in all lines. There is a glut of mealies, and other parts of South Africa have ample supplies at present. Potatoes are practically unobtainable at Bulawayo, and other lines are not forthcoming as plentifully as is desired.

Stock sales continue to attract plenty of customers, and prices generally must be regarded as satisfactory to breeders. At Messrs. Boggie & Co.'s quarterly stock sale, held in Gwelo on 22nd October, upwards of 300 head came into the sale yard. The attendance of buyers was good, and represented cattle dealers and farmers from Marandellas, on the one side, and Bulawayo, on the other. There was keen bidding for cross-bred or graded young cows and heifers. The highest price realised was £30, and the lowest £9. As usual, slaughter stock was in strong demand, and a fine lot of twelve heavy animals were knocked down for £13 5s. each. The average price was about 47s. 6d. per 100 lbs. Bulls, of which there were about 25 on the sale, principally Africanders and cross-bred Short-horns and Frieslands, were not in much request, the highest price paid being £13 10s. Buyers shewed a disposition to purchase only pure-bred bulls. There were only a few trek oxen on the sale, and these were sold at from £6 to £11 7s. 6d. There was a very strong enquiry for first-class dairy cows, of which there were only a few for sale. There was no demand for mules, horses or donkeys. The sale realised about £2,000. There was a marked falling off in the price paid for Mashona

cattle, but several buyers shewed a disposition to purchase Mashona heifers. Messrs. Boggie & Co.'s next sale will be held on 17th December.

Messrs. Leonard & Lezard held a successful sale at Gatooma on the 8th November, at which the following prices were realised:—Small cows, with running calves, £9 2s. 6d.; medium trek oxen, £8 7s. 6d.; native cows, crossed with Herefords, £9 2s. 6d. each; young three-year-old oxen, £7; Africander bull, £22; heifers, £7; milch cows, £11 10s. to £16 15s.

Although the cattle offered at the Marandellas Trading Co.'s sale, at Marandellas on the 13th November, were in first-class condition, the demand was not very good, and the prices realised were from £1 to £2 less than at previous sales. Trek oxen fetched from £9 to £11 5s.; slaughter oxen, £11 10s.; young oxen, £5 15s.; local heifers, from £7 11s.; local cows, with calves at foot, £10; half-bred cows, with calves at foot, £16 10s.; local cows, from £8 to £10.



| Article.                         | Johannesburg. |      | Kimberley. |      | Bulawayo. |      | Salisbury. |      |
|----------------------------------|---------------|------|------------|------|-----------|------|------------|------|
| Barley, 150 lbs. -               | 10/6          | 14/0 | 12/0       | 15/0 | —         | —    | 25/0       | 27/6 |
| Beans, 203 lbs. -                | 14/9          | 33/0 | —          | —    | —         | —    | 25/0       | 37/6 |
| Boer Meal, unsifted, 200 lbs. -  | —             | —    | 20/0       | 23/6 | 41/0      | 42/0 | 39/0       | 40/0 |
| Bran, wheaten, 100 lbs. -        | 6/0           | 6/6  | 7/0        | 8/0  | 12/0      | 13/0 | 15/0       | 16/0 |
| Flour, 100 lbs. -                | —             | —    | —          | —    | —         | —    | 18/0       | 22/6 |
| „ Colonial, 100 lbs. -           | —             | —    | —          | —    | 25/6      | 26/0 | —          | —    |
| Forage, 100 lbs. -               | 4/0           | 5/0  | 3/6        | 4/6  | 10/0      | 11/0 | 7/0        | 8/0  |
| „ Colonial Oat -                 | 4/3           | 4/9  | 4/6        | 5/6  | —         | —    | —          | —    |
| Hay -                            | 0/3           | 0/7  | —          | —    | 60/0      | 65/0 | 35/0       | 40/0 |
| Kaffir Corn, 200 lbs. -          | 12/0          | 15/6 | 11/0       | 13/0 | 22/6      | 23/0 | none       | —    |
| Manna, 100 lbs. -                | 1/0           | 3/0  | —          | —    | —         | —    | none       | —    |
| Mealies, S. A. White, 203 lbs. - | 9/9           | 10/6 | 9/6        | 11/3 | 13/6      | 14/6 | 9/0        | 10/0 |
| Mealies, Yellow, 203 lbs. -      | 8/9           | 9/6  | 8/0        | 9/0  | 13/0      | 13/6 | none       | —    |
| Mealie Meal, White, 183 lbs. -   | —             | —    | —          | —    | —         | —    | —          | —    |
| Munga, 200 lbs. -                | —             | —    | —          | —    | —         | —    | 15/0       | 20/0 |
| Monkey Nuts, bag -               | —             | —    | —          | —    | 12/6      | 13/6 | 8/6        | 10/0 |
| Oats, 150 lbs. -                 | 8/6           | 11/9 | 9/0        | 12/0 | —         | —    | 22/6       | 23/6 |
| Onions, 120 lbs. -               | 5/9           | 7/0  | 17/0       | 18/0 | —         | —    | 18/0       | 20/0 |
| Peas, 200 lbs. -                 | —             | —    | —          | —    | —         | —    | none       | —    |
| Potatoes, new, 150 lbs. -        | 12/6          | 15/6 | 18/0       | 21/6 | —         | —    | 12/6       | 15/0 |
| „ old, 150 lbs. -                | 7/6           | 10/6 | —          | —    | —         | —    | none       | —    |
| Rapoko -                         | —             | —    | —          | —    | —         | —    | 13/0       | 15/0 |
| Rye, 200 lbs. -                  | 18/6          | 19/0 | 20/0       | 22/0 | —         | —    | —          | —    |
| Salt, 200 lbs. -                 | 3/9           | 4/9  | —          | —    | 10/6      | 11/0 | 11/6       | 12/0 |
| Wheat, 203 lbs. -                | 20/6          | 23/6 | 21/0       | 22/0 | —         | —    | 27/0       | 28/0 |
| Butter, local, per lb. -         | 8d.           | 1/1  | 10d.       | 1/0  | —         | —    | 2/0        | —    |
| Eggs, local, per dozen -         | 9d.           | 11d. | 10d.       | 1/3  | —         | —    | 2/6        | 2/9  |
| Ducks, each -                    | 3/6           | 4/3  | 4/0        | 4/3  | —         | —    | 4/0        | 4/6  |
| Fowls, each -                    | 2/0           | 3/6  | 2/11       | 3/6  | 1/6       | 2/0  | 3/0        | 4/6  |
| Geese, each -                    | 4/0           | 4/9  | —          | —    | —         | —    | 9/0        | 11/0 |
| Turkeys, cocks, each -           | 8/0           | 17/6 | —          | —    | —         | —    | 12/6       | 17/6 |

## LIVE STOCK.

|                              |       |       |   |   |        |        |       |        |
|------------------------------|-------|-------|---|---|--------|--------|-------|--------|
| Slaughter Cattle, 100 lbs. - | 39/0  | 40/0  | — | — | 32/0   | 40/0   | 42/6  | 45/0   |
| Trek Oxen, trained -         | £7/10 | £9    | — | — | £8/10  | £12    | £9/10 | £11/10 |
| Local Cows, milk -           | £8    | £14   | — | — | £17/10 | £30    | —     | —      |
| Dairy Cows -                 | £16   | £26   | — | — | £20    | £32    | £25   | £30    |
| Native Cows -                | —     | —     | — | — | —      | —      | £8/10 | £10    |
| Heifers, Colonial -          | £5/10 | £8    | — | — | £8     | £17/10 | £9    | £11/10 |
| „ Native -                   | —     | —     | — | — | —      | —      | £5    | £6     |
| Pigs, live weight -          | 2½d.  | 5½d.  | — | — | 4½d.   | 5½d.   | 4d.   | 4½d.   |
| Horses, riding, salted -     | —     | —     | — | — | —      | —      | £35   | £40    |
| „ „ unsalted -               | £15   | £20   | — | — | £20    | £35    | £20   | —      |
| Mules, inoculated -          | £25   | £35   | — | — | £35    | £40    | £25   | £30    |
| Donkeys, geldings -          | £5    | £6/10 | — | — | £7     | £8/10  | £5    | £7/10  |
| „ mares -                    | £6    | £7    | — | — | £8/10  | £10/10 | £7/10 | £10    |
| Goats -                      | 16/0  | £1    | — | — | 11/0   | 13/6   | 11/0  | 14/0   |
| Persian Ewes -               | —     | —     | — | — | —      | —      | 18/6  | 21/0   |
| Cross-bred Ewes -            | 15/0  | £1    | — | — | —      | —      | 15/0  | 17/0   |
| Sheep, slaughter -           | 6d.   | 6½d.  | — | — | 16/0   | 21/0   | 20/0  | 23/6   |

(Good)

# Weather Bureau.

## TEMPERATURES.

| STATION                               | SEPTEMBER |      | OCTOBER |      |
|---------------------------------------|-----------|------|---------|------|
|                                       | Max.      | Min. | Max.    | Min. |
| <b>MASHONALAND—</b>                   |           |      |         |      |
| Hartley, Giant Mine ...               | —         | —    | 90·2    | 62·5 |
| „ Hallingbury Farm ...                | 86·0      | 52·6 | 90·4    | 57·9 |
| Lomagundi, Kanyemba ...               | 93·5      | 61·2 | 101·8   | 73·1 |
| „ Sipolilo ...                        | 86·4      | 57·1 | —       | —    |
| Mazoe, Shamva Mine ...                | 86·5      | 59·1 | —       | —    |
| Melsetter, Government Offices ...     | 73·9      | 50·8 | 79·5    | 63·0 |
| „ Mount Selinda ...                   | 75·4      | 54·1 | 78·8    | 59·9 |
| Salisbury, Agricultural Laborat'y ... | 78·9      | 51·0 | 84·3    | 56·6 |
| „ Chishawasha ...                     | 80·8      | 49·3 | 87·7    | 54·1 |
| „ The Gaol... ...                     | 83·8      | 50·2 | 89·3    | 54·7 |
| Umtali, Chiconga's Location ...       | 81·3      | 54·3 | 84·0    | 59·3 |
| „ Summerfield ...                     | 75·3      | 50·9 | 80·5    | 55·5 |
| Victoria ...                          | 81·3      | —    | 84·2    | —    |
| <b>MATABELELAND—</b>                  |           |      |         |      |
| Bulalima, Plumtree ...                | —         | —    | —       | —    |
| Bulawayo, Essexvale ...               | 84·6      | 54·3 | 88·2    | 60·9 |
| „ Observatory ...                     | 81·9      | 52·4 | 85·2    | 58·5 |
| „ Rhodes Matopo Park... ..            | 90·0      | 54·7 | 90·6    | 58·3 |
| Gwelo, The Gaol ...                   | 85·0      | 52·8 | 90·0    | 57·6 |
| Mangwe, Empandeni ...                 | 87·8      | 52·0 | 92·4    | 56·2 |
| Tuli, Police Camp ...                 | 87·5      | 57·0 | 94·6    | 64·5 |

## RAINFALL.

| STATION               | Sept. | Oct. |
|-----------------------|-------|------|
| <b>MASHONALAND :</b>  |       |      |
| <b>Charter—</b>       |       |      |
| Driefontein ...       | 0·28  | 0·61 |
| Enkeldoorn ...        | 0·57  | 0·90 |
| Grootfontein ...      | 0·28  | 0·76 |
| Marshbrook ...        | 0·31  | 0·86 |
| The Range ...         | 0·15  | 0·22 |
| Rhodesdale Estate ... | x     | x    |
| Riversdale ...        | 0·25  | 0·35 |
| Umvuma (Railway) ...  | —     | 1·34 |

## RAINFALL—(Continued).

| STATION                   |     |     |     | Sept. | Oct.  |
|---------------------------|-----|-----|-----|-------|-------|
| MASHONALAND—(Continued)   |     |     |     |       |       |
| Hartley—                  |     |     |     |       |       |
| Ardgowan                  | ... | ... | ... | —     | 0·88  |
| Battlefields (Railway)    | ... | ... | ... | —     | —     |
| Beatrice Mine             | ... | ... | ... | 0·37  | 0·46  |
| Carnock Farm              | ... | ... | ... | 0·69  | 0·16  |
| Elandsfontein             | ... | ... | ... | 0·18  | 0·26  |
| Elvington                 | ... | ... | ... | 0·20  | 1·09  |
| Franceys                  | ... | ... | ... | 0·39  | x     |
| Gatooma                   | ... | ... | ... | 0·02  | 2·11  |
| Gatooma (Railway)         | ... | ... | ... | —     | 1·86  |
| Giant Mine                | ... | ... | ... | 0·05  | 1·09  |
| Gowerlands                | ... | ... | ... | 0·10  | 0·56  |
| Hallingbury               | ... | ... | ... | 0·07  | 1·49  |
| Hartley (Gaol)            | ... | ... | ... | x     | x     |
| Hartley (Railway)         | ... | ... | ... | —     | 0·69  |
| Impofhoe                  | ... | ... | ... | 0·51  | 0·46  |
| “Jenkinstown”             | ... | ... | ... | 0·60  | 0·40  |
| Makwiro                   | ... | ... | ... | 0·46  | 0·50  |
| Shagari                   | ... | ... | ... | 0·11  | 0·74  |
| “Stoneygate”              | ... | ... | ... | —     | 1·00  |
| Lomagundi—                |     |     |     |       |       |
| Banket Junction (Railway) | ... | ... | ... | —     | 0·50? |
| Darwendale                | ... | ... | ... | x     | x     |
| Duxbury Farm              | ... | ... | ... | 0·01  | 0·45  |
| Eldorado (Railway)        | ... | ... | ... | —     | —     |
| Kanyemba                  | ... | ... | ... | —     | 0·40  |
| Lone Cow Estate           | ... | ... | ... | x     | x     |
| Palm Tree Farm            | ... | ... | ... | 0·04  | 0·27  |
| Sinoia                    | ... | ... | ... | x     | x     |
| Sipolilo                  | ... | ... | ... | —     | x     |
| Makoni—                   |     |     |     |       |       |
| Chimbi Source             | ... | ... | ... | 0·06  | 1·70  |
| Eagle's Nest              | ... | ... | ... | 0·43  | 1·12  |
| Ellavale                  | ... | ... | ... | 0·68  | 3·48  |
| Inyanga                   | ... | ... | ... | x     | —     |
| Mona                      | ... | ... | ... | 0·72  | 2·35  |
| Monte Cassino Mission     | ... | ... | ... | 0·32  | 1·67  |
| River Junction            | ... | ... | ... | 0·02  | 2·55  |
| Rusape                    | ... | ... | ... | 0·32  | x     |
| Rusape (Railway)          | ... | ... | ... | 0·65  | 2·62  |
| Springs                   | ... | ... | ... | x     | 2·27  |
| St. Trias' Hill           | ... | ... | ... | 1·06  | 0·80  |
| Odzi (Railway)            | ... | ... | ... | —     | 1·77  |
| York Farm                 | ... | ... | ... | 0·49  | 0·85  |
| Mangwendi—                |     |     |     |       |       |
| Bonongwe                  | ... | ... | ... | —     | 0·83  |
| Glen Somerset             | ... | ... | ... | 0·19  | 1·54  |
| Huish                     | ... | ... | ... | x     | x     |
| Land Settlement Farm      | ... | ... | ... | 0·52  | 1·03  |
| Macheke (Railway)         | ... | ... | ... | 0·64  | 1·55  |
| Marandellas               | ... | ... | ... | —     | x     |



## RAINFALL—(Continued).

| STATION                             |     |     | Sept. | Oct. |
|-------------------------------------|-----|-----|-------|------|
| MASHONALAND—(Continued)             |     |     |       |      |
| Mangwendi (Continued)               |     |     |       |      |
| Marandellas (Railway)               | ... | ... | 0·22  | 1·63 |
| Mrewa                               | ... | ... | 0·03  | 1·74 |
| Mungo                               | ... | ... | —     | 0·86 |
| Rusawi Outspan                      | ... | ... | 0·43  | 0·85 |
| Selous Nek                          | ... | ... | x     | 0·37 |
| Theydon                             | ... | ... | 0·63  | x    |
| Tweedjan                            | ... | ... | —     | 0·95 |
| Mazoe—                              |     |     |       |      |
| Avonduur                            | ... | ... | x     | 0·60 |
| Bindura                             | ... | ... | x     | x    |
| Chin Mine, Mount Darwin             | ... | ... | x     | x    |
| Chipoli                             | ... | ... | 0·05  | x    |
| Claverhill                          | ... | ... | 0·30  | 1·66 |
| Darwin                              | ... | ... | 0·41  | 0·75 |
| Dunmaglas                           | ... | ... | x     | 0·99 |
| Lagnaha                             | ... | ... | x     | x    |
| Lowdale                             | ... | ... | 0·57  | 0·11 |
| Mazoe, Native Commissioner's Office | ... | ... | 0·46  | 0·41 |
| Mguta Valley                        | ... | ... | 0·63  | —    |
| Omeath                              | ... | ... | 0·09  | 1·55 |
| Ruia                                | ... | ... | 0·26  | 2·10 |
| Shamva                              | ... | ... | 0·45  | x    |
| „ Mine                              | ... | ... | 0·25  | x    |
| Sleamish                            | ... | ... | —     | 0·94 |
| Sunnyside                           | ... | ... | 0·09  | x    |
| Teign                               | ... | ... | 0·44  | 0·86 |
| Umvukwe Flats                       | ... | ... | x     | 1·74 |
| Waterfall                           | ... | ... | 0·50  | x    |
| Melsetter—                          |     |     |       |      |
| Chikori                             | ... | ... | 0·56  | 0·76 |
| Chipinga                            | ... | ... | 0·77  | 1·28 |
| Helvetia                            | ... | ... | x     | x    |
| Melsetter                           | ... | ... | 0·66  | 0·46 |
| Mount Selinda                       | ... | ... | 1·51  | 2·13 |
| Mutambara Mission                   | ... | ... | 0·43  | x    |
| Pasture                             | ... | ... | 2·20  | 0·98 |
| Tom's Hope                          | ... | ... | 0·67  | 2·57 |
| Vermont                             | ... | ... | 1·52  | 1·95 |
| Salisbury—                          |     |     |       |      |
| Agricultural Laboratory             | ... | ... | 0·90  | 0·78 |
| Avondale                            | ... | ... | 1·30  | 2·47 |
| Brookmead                           | ... | ... | 0·56  | x    |
| Cleveland Reservoir                 | ... | ... | 0·46  | 0·83 |
| Convent                             | ... | ... | 0·12  | 0·98 |
| Chishawasha                         | ... | ... | 0·53  | 0·72 |
| Goromonzi                           | ... | ... | 1·82  | 0·50 |
| Gwibi                               | ... | ... | 0·48  | x    |
| Hillside                            | ... | ... | x     | x    |
| Lilfordia                           | ... | ... | 0·38  | x    |

RAINFALL (*Continued*).

| STATION                 |     |     |     | Sept. | Oct. |
|-------------------------|-----|-----|-----|-------|------|
| MASHONALAND—(Continued) |     |     |     |       |      |
| Salisbury (Continued)   |     |     |     |       |      |
| Meadows                 | ... | ... | ... | x     | x    |
| Public Gardens          | ... | ... | ... | x     | x    |
| Rhodesville             | ... | ... | ... | 0·66  | 2·20 |
| Salisbury (Club)        | ... | ... | ... | 0·17  | 1·31 |
| „ (Gaol)                | ... | ... | ... | 0·19  | 1·67 |
| „ (Railway)             | ... | ... | ... | —     | 1·53 |
| Stapleford              | ... | ... | ... | 0·53  | x    |
| Westridge               | ... | ... | ... | 0·27  | 0·67 |
| Umtali—                 |     |     |     |       |      |
| Chiconga's Location     | ... | ... | ... | 0·34  | 2·38 |
| Champion Mine           | ... | ... | ... | x     | x    |
| Gaol                    | ... | ... | ... | x     | x    |
| Odzani                  | ... | ... | ... | 0·50  | 1·85 |
| Premier Estate          | ... | ... | ... | x     | x    |
| Selim Mine              | ... | ... | ... | x     | x    |
| Summerfield             | ... | ... | ... | 0·72  | 1·76 |
| Umtali (Railway)        | ... | ... | ... | 1·06  | 1·55 |
| Utopia                  | ... | ... | ... | 1·14  | x    |
| Victoria—               |     |     |     |       |      |
| Chibi                   | ... | ... | ... | 0·37  | x    |
| Chilimanzi              | ... | ... | ... | 0·13  | x    |
| Chingombe               | ... | ... | ... | 0·03  | 2·63 |
| Chiredzi Ranche, Ndanga | ... | ... | ... | 0·03  | 0·22 |
| Gokomere                | ... | ... | ... | 0·31  | 1·14 |
| Gutu                    | ... | ... | ... | —     | 2·30 |
| Halliday's Farm         | ... | ... | ... | 0·03  | 0·84 |
| Makorsi River Ranche    | ... | ... | ... | x     | 0·48 |
| Marah Ranche            | ... | ... | ... | 0·75  | 1·63 |
| Marthadale              | ... | ... | ... | 0·93  | 2·48 |
| Morgenster              | ... | ... | ... | 0·13  | 2·19 |
| Noeldale                | ... | ... | ... | 0·19  | 1·37 |
| Pamushana               | ... | ... | ... | 0·09  | 1·89 |
| Silver Oaks             | ... | ... | ... | 0·01  | 1·34 |
| Victoria                | ... | ... | ... | 0·05  | 1·49 |
| MATABELELAND :          |     |     |     |       |      |
| Belingwe—               |     |     |     |       |      |
| Anglo-French Block      | ... | ... | ... | x     | 0·59 |
| Dewhurst                | ... | ... | ... | x     | 1·19 |
| Filabusi                | ... | ... | ... | —     | 0·97 |
| Fort Rixon              | ... | ... | ... | 0·26  | —    |
| Infiningwe              | ... | ... | ... | 0·15  | 0·69 |
| Insiza (Railway)        | ... | ... | ... | 0·30  | 0·10 |
| Shangani (Railway)      | ... | ... | ... | 0·17  | 0·35 |
| Tamba                   | ... | ... | ... | 0·40  | 0·50 |
| Thornville              | ... | ... | ... | 0·31  | 0·82 |
| Bubi—                   |     |     |     |       |      |
| Braemar                 | ... | ... | ... | —     | 0·12 |
| Inyati                  | ... | ... | ... | x     | 0·04 |
| Lochard Experiment Farm | ... | ... | ... | 0·26  | 0·37 |

RAINFALL (*Continued*).

| STATION                         |     |     |     | Sept. | Oct. |
|---------------------------------|-----|-----|-----|-------|------|
| <b>MATABELELAND—(Continued)</b> |     |     |     |       |      |
| Bulalima—                       |     |     |     |       |      |
| Figtree                         | ... | ... | ... | 0·15  | 0·87 |
| Mholi (late Magot)              | ... | ... | ... | 0·05  | 0·49 |
| Marula                          | ... | ... | ... | x     | x    |
| Plumtree                        | ... | ... | ... | x     | x    |
| Solusi                          | ... | ... | ... | 0·14  | 1·29 |
| Syringa                         | ... | ... | ... | 0·09  | 0·37 |
| Tegwani                         | ... | ... | ... | x     | x    |
| Bulawayo—                       |     |     |     |       |      |
| Balla Balla (Railway)           | ... | ... | ... | 0·06  | 1·44 |
| Bembesi (Railway)               | ... | ... | ... | 0·52  | 0·41 |
| Essexvale                       | ... | ... | ... | 0·12  | 1·37 |
| Government House                | ... | ... | ... | x     | x    |
| Gwaai (Railway)                 | ... | ... | ... | —     | 0·79 |
| Heany Junction (Railway)        | ... | ... | ... | —     | 0·22 |
| Hope Fountain                   | ... | ... | ... | 0·34  | 2·97 |
| Imbesu Kraal                    | ... | ... | ... | 0·22  | 0·18 |
| Khami                           | ... | ... | ... | 0·18  | 3·19 |
| Keendale                        | ... | ... | ... | 0·17  | 0·21 |
| Lower Rangemore                 | ... | ... | ... | x     | 1·55 |
| Matopo Mission                  | ... | ... | ... | x     | 0·33 |
| Maxim Hill                      | ... | ... | ... | —     | 0·36 |
| Mpondeni                        | ... | ... | ... | x     | x    |
| Nyamandhlovu (Railway)          | ... | ... | ... | 1·15  | 0·06 |
| Observatory                     | ... | ... | ... | 0·08  | 2·65 |
| Pendennis                       | ... | ... | ... | 0·11  | 1·58 |
| Raylton                         | ... | ... | ... | 0·04  | 3·47 |
| Rhodes Matopo Park              | ... | ... | ... | 0·32  | 0·80 |
| Umgusa                          | ... | ... | ... | 0·10  | 0·53 |
| Umkien                          | ... | ... | ... | x     | 0·46 |
| Gwanda—                         |     |     |     |       |      |
| Antelope Mine                   | ... | ... | ... | 0·03  | 1·03 |
| Gwanda (Gaol)                   | ... | ... | ... | x     | 0·03 |
| „ (Railway)                     | ... | ... | ... | —     | 0·28 |
| Malundi                         | ... | ... | ... | 0·02  | 1·34 |
| Mtshabzi Mission                | ... | ... | ... | —     | 0·65 |
| West Nicholson (Railway)        | ... | ... | ... | —     | 0·46 |
| Gwelo—                          |     |     |     |       |      |
| Globe and Phoenix (Railway)     | ... | ... | ... | 0·37  | 1·47 |
| Gwelo (Gaol)                    | ... | ... | ... | 0·49  | 0·59 |
| Gwelo (Railway)                 | ... | ... | ... | 0·41  | 0·53 |
| Iron Mine Hill                  | ... | ... | ... | 0·24  | 0·67 |
| Lalapanzi                       | ... | ... | ... | 0·39  | 0·87 |
| Lochiel                         | ... | ... | ... | 0·13  | 0·27 |
| Lower Gwelo                     | ... | ... | ... | 0·14  | 0·47 |
| Que Que                         | ... | ... | ... | x     | x    |
| Rhodesdale Estate               | ... | ... | ... | 0·13  | 2·41 |
| Selukwe (Railway)               | ... | ... | ... | 0·83  | 1·20 |
| Shawlands                       | ... | ... | ... | 0·80  | 0·64 |
| Sheltered Vale                  | ... | ... | ... | —     | 0·25 |



RAINFALL *(Continued)*

| STATION                  |     |     |     | Sept. | Oct. |
|--------------------------|-----|-----|-----|-------|------|
| MATABELELAND—(Continued) |     |     |     |       |      |
| Mafungabusi—             |     |     |     |       |      |
| Gokwe                    | ... | ... | ... | 0·20  | 1·14 |
| Mangwe—                  |     |     |     |       |      |
| Empandeni                | ... | ... | ... | 0·06  | 0·54 |
| Garth                    | ... | ... | ... | 0·04  | 0·38 |
| Tuli—                    |     |     |     |       |      |
| Lamulas                  | ... | ... | ... | 0·03  | x    |
| Langalanga               | ... | ... | ... | 0·40  | x    |
| Makalali                 | ... | ... | ... | 0·05  | x    |
| Manantji                 | ... | ... | ... | 0·15  | x    |
| Manyoni                  | ... | ... | ... | 0·03  | x    |
| Mazunga                  | ... | ... | ... | 0·06  | x    |
| Tuli                     | ... | ... | ... | 0·02  | 0·43 |
| Wankies—                 |     |     |     |       |      |
| Malindi (Railway)        | ... | ... | ... | 0·04  | 0·35 |
| Victoria Falls           | ... | ... | ... | 0·04  | 0·10 |
| Victoria Falls (Railway) | ... | ... | ... | 0·03  | 0·14 |
| Wankies Hospital         | ... | ... | ... | 0·04  | x    |
| Wankies (Railway)        | ... | ... | ... | 0·11  | 0·02 |

x No return received.

— No rainfall.

# Dates of Meetings of Farmers' Associations, Southern Rhodesia

(SUBJECT TO ALTERATION)

| Name of Association              | Place of Meeting        | Secretary            | 1913-14 |             |      |
|----------------------------------|-------------------------|----------------------|---------|-------------|------|
|                                  |                         |                      | Dec.    | Jan.        | Feb. |
| Bindura                          | Thurlow's Hotel         | A. M. Robb           | ..      | 10          | ..   |
| Charter—Mgezi                    | Mgezi River             | W. Krienke           | ..      | 28          | ..   |
| Central                          | Unvuma..                | C. Napier            | 30      | ..          | ..   |
| Enterprise                       | Arcturus Hotel          | R. Philip            | 9       | 13          | 10   |
| Figtree Branch, R.L. and F.A.    | Figtree Hotel           | A. Curtis            | ..      | ..          | ..   |
| Gatoona                          | Gatoona                 | ..                   | 20      | 17          | 21   |
| Gazaland                         | Chipinga                | ..                   | ..      | 29          | ..   |
| Greystone                        | Rodeheuevel             | W. Wood              | 13      | 10          | 14   |
| Hartley                          | Hartley                 | J. W. Spencer        | 6       | 10          | 7    |
| Headlands                        | Headlands               | L. Savory            | ..      | ..          | 28   |
| Insiza                           | Station Hotel           | H. Barnes Pope       | ..      | ..          | ..   |
| Lalapanzi                        | Station Hotel           | N. C. St. J. Breslin | ..      | 3           | ..   |
| Lomagundi                        | Lalapanzi Hotel         | B. Smit              | 19      | ..          | ..   |
| Macheke                          | Sinoia                  | J. N. Bateman        | ..      | ..          | ..   |
| Makoni                           | Macheke                 | H. H. Kidson         | ..      | 3           | ..   |
| Makwiro                          | Rusape                  | W. S. Tapson         | 6       | 3           | 7    |
| Marandellas                      | Makwiro                 | A. B. Fraser         | 20      | ..          | ..   |
| Mangwendi                        | Fixed every meeting     | W. P. de Kock        | 6       | 3           | 7    |
| Marula                           | Marula Siding           | ..                   | ..      | ..          | ..   |
| Mashonaland                      | Salisbury               | MacW. Ingram         | 27      | 24          | 28   |
| Matopo Branch, R.L. and F.A.     | Malundi Hotel           | W. H. Williamson     | 13      | 10          | 14   |
| Mazoe                            | Mazoe Hotel             | W. Bathurst          | ..      | 8           | ..   |
| Melsetter (North)..              | Various Farm Houses     | F. C. Peek           | 10      | ..          | 11   |
| Midlands                         | Gwelo                   | N. N. Rutherford     | ..      | ..          | ..   |
| Northern                         | Farm "Summerfield"      | H. K. Pinches        | ..      | ..          | ..   |
| Plumtree                         | Plumtree                | R. V. H. Blurton     | ..      | 3           | ..   |
| Rhodesian Landowners and Farmers | Globe and Phoenix Hotel | H. J. Brooke         | 13      | 10          | 14   |
| Shamva                           | Bulawayo                | E. E. Somersel       | 20      | 17          | 21   |
| Southern                         | Shamva                  | H. S. Hopkins        | 26      | 30          | 27   |
| Insiza                           | Peggy Hotel             | J. M. Moubray        | No      | dates fixed | 1    |
| Somabula and Shangani Flats      | Selukwe                 | W. J. B. Harris      | 7       | 4           | 7    |
| Umvukwe                          | Somabula                | F. S. Clark          | No      | dates fixed | ..   |
| Victoria                         | Victoria                | S. Annandale         | 6       | 3           | ..   |
| Umtali                           | Christmas Pass Hotel    | J. Rutherford        | 17      | 21          | 18   |
|                                  |                         | J. S. Holland        | 6       | 3           | 7    |

## Departmental Notices.

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### Information for Farmers

The Department of Agriculture is prepared to furnish to farmers technical advice either by correspondence, or, where possible, by personal visits. All communications should be addressed in the first instance to the Director of Agriculture.

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### Crops

The Agricultural Branch deals with enquiries relating to agricultural practice, soils, crops, cultural operations, processes, seeds, trees, farm implements and machinery, etc.

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### Poisonous Plants

It is of great importance that as soon as possible a study should be made of those plants found in Southern Rhodesia which are poisonous or deleterious to small or large stock. Farmers and others who have known, or suspected poisonous plants on their property, are requested to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, at the same time forwarding specimens of the plant, including stem, leaves, flowers, and, where possible, fruit. Any particular regarding the habits of the plant will be welcomed, and in return the Department will supply all available information regarding the plants.

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### Disposal of Seeds

All farmers and others who have surplus supplies of good quality locally grown farm seed of any description are invited to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, stating what



quantities are available for sale, and price f.o.r. nearest station. In all cases representative samples of the grain must accompany the letter, but need not exceed two ounces in weight.

The Agricultural Department is continually receiving enquiries as to where various seeds can be obtained, and it is hoped that by the above means growers of reliable seed may be brought into touch with one another.

It must be clearly understood, however, that beyond recommending sources of supply, the Department cannot take any further part in the transaction.

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### **Tobacco**

The services of the Tobacco Expert are available to all desiring advice on the subject. Applications should be accompanied by particulars of the nature of the information sought, also the distance and direction of the farm from some well known centre.

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### **Live Stock**

The Animal Industry Branch is prepared to advise with regard to all matters connected with stock breeding, selection, feeding and registration of stud animals, the dairy industry, poultry management, farm buildings for stock, and kindred subjects. Buyers and sellers of stud stock in Rhodesia are also put in touch with one another.

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### **Purchase of Stock in the Cape and Free State Provinces of the South African Union, on behalf of Farmers resident in Southern Rhodesia**

The following amended arrangements are published for general information :—

The Government undertakes the purchase of pure-bred live stock for farmers on the conditions outlined below, and on the following terms of payment, viz. :—(1) a deposit on application; (2) one-third total cost on delivery, less amount of

deposit; (3) one-third after six months, and (4) one-third after twelve months—both these instalments bearing interest at 6 per cent. or 10 per cent. if not paid at due date. These terms of credit will only be allowed on purchases up to a total maximum value of £200; sums exceeding that amount are payable in cash along with the first instalment. The Government reserves the right to refuse, without reason given, applications, or to fulfil purchases even after deposit has been made. Applications must be on the prescribed Form "A," and all conditions complied with before same is registered. Applications will be considered in rotation, but fulfilled as opportunity serves, so that animals may be procured as cheaply as possible. The buyer must undertake to accept the animal allotted to him, unless it fails to satisfy description as given in the application form. Disputes may be submitted to arbitration. The purchase price will include all expenses up to time of delivery, price paid to original owner, commission and charges of buyer and freight, including, where necessary, attendance and keep on journey. With every application a deposit must be forwarded; £1 per head in the case of cattle, horses and donkeys, and 5s. per head for sheep, goats and pigs. Such deposit will be deducted from the amount of the first instalment due, but may be forfeited in the event of the application being withdrawn after having been registered. Stock is not to be disposed of without the written consent of the Director of Agriculture until payment is completed.

Purchases will be made by the Department of Agriculture through its authorised representatives. Every effort will be made to secure animals in accordance with particulars furnished by applicants, and to the best advantage. All purchases must conform strictly to the importation regulations as regards age and freedom from contact with contagious disease. Pedigrees, if obtainable, will be supplied. The Government will bear all risks of transport and of death from any cause until delivery, all losses being chargeable to the vote. All animals failing to pass the necessary test on arrival shall be destroyed and the loss borne by the Government, and another animal purchased for the applicant.

Prospective buyers will be advised of the probable cost. The Department does not undertake to purchase stock at precisely the prices specified by applicants, but will endeavour to

approximate as nearly as possible to the figures given and not to exceed same by over 20 per cent. The authorised representatives of the Department will be allowed a reasonable commission, with expenses additional.

The first instalment will become due and payable on delivery. Applicants or their agents will be advised regarding arrival of their stock, after which all responsibility on the part of the Department will cease.

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### Entomology

The Government Entomologist advises on matters connected with insect pests of live stock, crops, and fruit trees, and also undertakes the inspection of nurseries and of the importation of plants from abroad.

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### Chemical Analyses

The Government Agricultural Chemist deals with matters relating to the composition of soils, fertilisers, farm produce of vegetable or animal origin; also the investigation of poisons and of articles of potential economic value.

Nominal charges are made, which, while not covering the cost, will help to defray the expense and serve as a proof of good faith. Samples, carriage prepaid, together with full particulars regarding the subject should be addressed to the Agricultural Chemist, Department of Agriculture, Salisbury.

A schedule of charges and directions for taking samples will be furnished on application.

With all analyses, reports will be furnished explanatory of the results and, when possible, advice given as to the nature, properties and value of the material.

No charge will be made for analysis where the material forwarded is considered by the Director of Agriculture and Chemist to be of sufficient general interest.



## Services of Government Veterinary Surgeons

1. The services of Government Veterinary Surgeons are available to the public, free of charge, for the following purposes only :—

- (1) Attending and giving professional advice in connection with the following diseases, viz. :—Anthrax, Contagious abortion, East Coast Fever, Epizootic Lymphangitis, Foot and Mouth Disease, Farcy, Foot-rot, Heartwater, Glanders, Intestinal parasites amongst sheep and goats, Liver Disease, Lungsickness, Osteo Porosis, Malarial Catarrhal Fever (blue tongue), Rabies, Redwater, Rinderpest, Scabies, Sponziekte (quarter evil), Swine Fever, and any other diseases which may in future be scheduled in terms of section 3, sub-section 18 of the "Animals Diseases Consolidation Ordinance, 1906." Attending to cases of disease amongst live stock which, though not of a contagious or infectious character, may be of general public importance.

- (2) Applying tests in regard to Glanders, Tuberculosis, or any other disease against the introduction or spread of which tests are applied under regulations.

- (3) Inoculations against the following diseases :—

Horsesickness, Lungsickness, Anthrax, Quarter Evil, Redwater, Malarial Catarrhal Fever (blue tongue). A fee to cover the cost of serum and virus will be charged.

2. The following charges shall be made and payable for services rendered by the Government Veterinary Surgeons in other cases, viz. :—

|   | £ | s. | d. |
|---|---|----|----|
| (1) For every professional visit within three miles of his office or residence ... ..                 | 0 | 5  | 0  |
| (2) For every professional visit beyond such distance ... ..  | 0 | 10 | 6  |
| plus an additional charge of 2/6 per hour whilst engaged in such visits or £2/2/0 a day of 24 hours ; |   |    |    |

|   | £ | s. | d |
|---|---|----|---|
| (3) For advice given at the Veterinary Surgeon's office, for each animal, per visit | 0 | 2  | 6 |

(4) The following to be charged in addition to visiting fees :—

|   |   |    |   |
|---|---|----|---|
| a. For every examination as to soundness, each ... ..             | 1 | 1  | 0 |
| b. For castration, horses, each ... ..                            | 1 | 1  | 0 |
| c. For castration, bulls, each ....                               | 0 | 5  | 0 |
| d. For castration, donkeys, each..                                | 0 | 10 | 6 |
| e. For parturition cases, mares, each                             | 2 | 2  | 0 |
| f. For parturition cases, cows, each..                            | 1 | 1  | 0 |
| g. For other operations, according to nature, from 5/- to £2/2/0. |   |    |   |

3. Double the above fees will be payable for services rendered on Sundays, public holidays, and between the hours of 7 p.m. and 7 a.m.

4. Applicants for the services of Government Veterinary Surgeons must at their own cost provide the necessary transport for the conveyance of these officers from, and back to, their residence or nearest railway station.

5. Farmers and owners of stock throughout the country frequently telegraph for a Government Veterinary Surgeon to be sent to attend an animal which has been taken seriously ill. It is rarely possible to comply with these requests at once, as the Veterinary Surgeon may be engaged on duty which he cannot leave, or is at such a distance from where his services are required that he can hardly be expected to arrive in time to be of any service in an urgent case. Hence much valuable time is wasted, the owner of the animal is dissatisfied, and the veterinary staff discredited. To obviate this, in all cases where veterinary advice and assistance are required, the owner should telegraph to "Veteran," Salisbury, with prepaid reply, the nature of the complaint that the animal is suffering from, giving as full and accurate a description of the symptoms as possible. This will enable the Chief Veterinary Surgeon to telegraph advice at once and state whether he is able to arrange for veterinary attendance on the case or not, and save valuable time, which is always of importance in acute cases.

6. The services of Government Veterinary Surgeons will only be available for private work with the consent of such officers, and when such work does not interfere with their official duties, or when the services of a private practitioner are not available.

7. As the arrangement of allowing Government Veterinary Surgeons to attend to private cases is intended purely for the benefit of farmers and stock-owners who may wish to obtain professional advice, no responsibility whatever will be accepted for any loss of stock, etc., which may result from the negligent treatment or advice, or wilful default, of any Government Veterinary Surgeon.

8. All fees collected in terms of these Regulations are payable to the Treasury through the local Receiver of Revenue.

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### **Sale of Dip**

With a view to enabling farmers to obtain dipping material at as low a rate as possible arrangements have been made whereby orders may be placed with any officer of the Veterinary Department for the purchase of supplies of Messrs. W. Cooper & Nephew's cattle dipping fluid, adapted for three-day, five-day or less frequent dipping. The price of the dip is 48s. 6d. per 10 gals., in not less quantities than that amount, delivered at any siding or station desired, in 5 gal. drums. Applications must be accompanied by remittances, without which they cannot receive attention. Remittances by cheque should be made in favour of Messrs. Meikle Bros., agents for the dipping fluid, commission being added, where necessary, to cover exchange. Coin or stamps will not be accepted. This dip is in use at all Government dipping tanks.

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### **Sale of Virus**

It is notified for public information that redwater and gall-sickness (*anaplasmosis*) virus may be obtained from the Veterinary Department, Salisbury, at a charge of ten shillings per dose.

Solutions of trypan blue and the injection used in the treatment of *trypanosomiasis* (fly disease) of cattle may also be



obtained at a charge of five shillings per dose and blue tongue virus at one shilling and sixpence per dozen doses.

No material will be issued unless a remittance accompanies the order.

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### Irrigation

From the Agricultural Engineer assistance may be obtained by farmers for the following :—

1. In the locating of possible irrigation projects.
2. In the preparation of surveys or plans and for irrigation works, including weirs, dams, furrows, pumping plants, and determining the extent of land which may be brought under irrigation schemes, together with rough estimates of costs.
3. In the supervision of construction and carrying out of projects.
4. In the selection of suitable sites for boring operations.
5. Preparing specifications, etc., regarding pumping plants, windmills, and agricultural machinery.
6. Giving general advice on cognate subjects.

Informal advice of a general character will be given to applicants making enquiry by letter or in person. Any applicant desiring professional assistance likely to occupy more than one day should apply for advice in writing. All applicants should specify clearly the nature of the project on which they seek advice, and should give full particulars as to the distance and direction of their farms from some well-known centre. Applicants will be required to provide suitable means of transport for the officer concerned during the period devoted to work on the spot; to provide any unskilled labour that may be required; and to provide for any other contingent services. Applications should be addressed to the Director of Agriculture, who will endeavour to arrange visits as far as possible in order of application, but with due regard to situation, in order to obviate unnecessary travelling and delay. The services of the Agricultural Engineer are given free, but in cases demanding prolonged individual attention, or repeated supervision, a charge may be made according to circumstances.

## Samples

In connection with enquiries, especially with regard to diseases amongst crops, insect pests, soils, grain and the identification of plants, specimens should, wherever possible, be sent, together with full details. It is found that such parcels are often forwarded without any indication of where they are from or why they were sent and it is difficult in such cases to trace the sender. It is, therefore, requested that persons when forwarding samples for examination, indicate clearly their names and address on the package, so as to enable their requirements to be attended to without delay.

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## Charges for Dipping Cattle at Government Dipping Tanks.

On and after the 1st November, 1912, a charge of 1d. per head will be made in respect of all cattle dipped at Government dipping tanks.

Unweaned calves will be dipped free of charge.

Payment may be made in cash or by means of books of coupons at £1, 10/- and 2/6, which can be obtained from Civil Commissioners, Native Commissioners, or through all Veterinary Surgeons and Cattle Inspectors.

The tanks to which these provisions at present apply are the following :—

Salisbury (3), Bulawayo (3), Inyati, Umtali, Penhalonga, Melsetter, Marandellas, Macheke, Mazoe, Lomagundi, Hartley, Gwelo, Selukwe, Enkeldoorn, Victoria, Gwanda, Gatooma, Que Que, Umvuma, Kimberley Reefs.

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## Lectures for Farmers

The services of certain of the officers of the Department of Agriculture and the Veterinary Department are available for purposes of delivering lectures on subjects upon which they have special knowledge. As far as practicable, lectures will be accompanied by demonstrations at the time or subsequently in the field. Owing to the many calls on the time of the staff and the exigencies of their duties, alternative dates are desirable in order to avoid disappointment. The following topics are



offered as examples of subjects that may be dealt with in this manner, but the suggestion of other themes is invited.

*Agriculture.*—Maize growing; Maize selection and maintenance of the breeding plot; Points of maize and maize judging, with demonstrations; Utilisation of granite vlei soils; Ground nut culture; Rotation crops for home use and for sale; Veld improvement by winter grasses; Production of foodstuffs for the mines; Ensilage; Fungoid diseases of maize and wheat; Wheat, oats and lucerne under irrigation; The prospects of cotton culture in Southern Rhodesia.

*Veterinary Hygiene.*—Detection and prevention of disease; The care of live stock.

*Live Stock.*—Judging of cattle according to breeds, and for beef, milk and draught; feeding and kraaling of live stock; general principles of cattle breeding; management of imported stock; grading up of native or local stock with pure bred bulls.

*Dairying.*—Home butter-making; building and equipment of a farm dairy; handling and marketing of milk; packing and marketing of butter; construction of cow houses.

*Swine Husbandry.*—Breeding and feeding of swine; some suggestions for the production of first-class bacon pigs; construction of piggeries at moderate cost.

*Chemistry.*—The principles of soil fertility; the principles of manuring; the value of lime in agriculture; chemistry of milk and its products (accompanied by demonstrations in milk-testing).

*Entomology.*—Economic entomology on the farm; the role of insects and their allies in the transmission of disease; scale insects and fruit trees and methods for their control; insect pests and maize; enemies of the potato, insect and fungus; the value and objects of plant import and nursery regulations.

*Irrigation.*—Methods of applying water to land for irrigation; the measurement of water in connection with irrigation; canal irrigation; storage reservoirs; hints on the selection of sites and on the design of earthen and other dams; irrigation by pumping, with notes on the selection of plants.

Enquiries and invitations should in the first instance be addressed to the Director of Agriculture, Salisbury.



### Forestry: Sale of Trees.

The under-mentioned varieties of trees will be available for sale from December onwards. The price is 8s. 4d. per 100 in tins of 25, f.o.r. Salisbury. A quantity of larger sized trees, four in a tin, will also be available at 1s. per tin. In some cases the supplies are limited.

Aloe bulbels and seed of *Dalbergia sissoo* can also be supplied.

Applications, together with cheque or money order, should be addressed to the Government Agriculturist and Botanist, Department of Agriculture, Salisbury.

|                              |                      |
|------------------------------|----------------------|
| <i>Albizzia lebbek</i>       |                      |
| <i>Casuarina leptoclada</i>  | = Beefwood           |
| <i>Cedrela toona</i>         | = Indian toona       |
| <i>Callitris calcarata</i>   | = Cypress pine       |
| „ <i>robusta</i>             | = Murray pine        |
| <i>Cupressus arizonica</i>   | = Arizona cypress    |
| „ <i>lusitanica</i>          | = Portuguese cypress |
| „ <i>sempervirens</i>        | = Common cypress     |
| „ <i>torulosa</i>            | = Himalayan cypress  |
| <i>Dalbergia sissoo</i>      |                      |
| <i>Eucalyptus amygdalina</i> | = Peppermint gum     |
| „ <i>calophylla</i>          |                      |
| „ <i>citriodora</i>          | = Lemon-scented gum  |
| „ <i>longifolia</i>          |                      |
| „ <i>paniculata</i>          | = Iron bark gum      |
| „ <i>robusta</i>             | = Swamp mahogany     |
| „ <i>rostrata</i>            | = Rostrata gum       |
| „ <i>saligna</i>             | = Saligna gum        |
| „ <i>tereticornis</i>        | = Red gum            |
| <i>Jacaranda mimosæfolia</i> | = Jacaranda          |
| <i>Pinus densiflora</i>      |                      |
| „ <i>halepensis</i>          | = Aleppo pine        |
| „ <i>longifolia</i>          | = Cheer pine         |
| <i>Thuja orientalis</i>      | = Arbor vitæ         |
| „ <i>gigantea</i>            |                      |

### CITRUS CULTIVATION.

THE services of Mr. C. E. Farmer, Adviser on Citrus Cultivation to the British South Africa Company, are available. The British South Africa Company will be pleased to receive applications from farmers desirous of obtaining advice from Mr. C. E. Farmer on citrus cultivation, and to place his services at the disposal of the farming community, in so far as his duties permit. Applications, which will be dealt with in order of date, should be addressed to the Director of Land Settlement, Salisbury. No fee will be charged for Mr. Farmer's services.

## Departmental Bulletins

The following Bulletins, consisting of reprints of articles which have appeared in this Journal, are available for distribution free of charge to applicants in Rhodesia :—

### AGRICULTURE.

- No. 2. The Possibilities of Rhodesia as a Citrus Growing Country, by R. McIlwaine, M.A., LL.B.
- No. 61. Requirements in sending Botanical Specimens to the Department for Identification.
- No. 79. Winter Cereals, by H. Godfrey Mundy, F.L.S.
- No. 81. Possibilities of Export Trade in Oil Seeds, by H. Godfrey Mundy, F.L.S.
- No. 97. Hints on Irrigation (Pipes and Pipe-laying), by W. Martin Watt, Agricultural Engineer.
- No. 125. Subterranean Water, by W. M. Watt.
- No. 137. Drainage for Irrigated and Swampy Land, by W. M. Watt.
- No. 156. Elephant Grass or Napier's Fodder, by J. A. T. Walters, B.A.
- No. 160. Hints on Irrigation—Pumping Plants, by W. M. Watt, Agricultural Engineer.

### CROPS.

- No. 88. Chicory Growing, by H. Godfrey Mundy, F.L.S.
- No. 93. Soy Beans, by R. H. B. Dickson.
- No. 106. Cultivation and Preparation of Ginger.
- No. 107. The Cowpea, by R. H. B. Dickson.
- No. 126. Turkish Tobacco.
- No. 128. Paspalum, by J. A. T. Walters, B.A., Assistant Agriculturist and Botanist.
- No. 132. Sumatra Tobacco, Hints to Rhodesian Growers, by C. J. Sketchley.
- No. 133. Tobacco Culture (Virginia)—Planting, Cultivation, Fertilising, Priming, Topping, Suckering, Ripening.
- No. 138. Tobacco Culture (Virginia)—Harvesting and Curing.
- No. 162. Rhodesian Maize: The Principal Types and their Points, by J. A. T. Walters, B.A., Assistant Agriculturist.

### ENTOMOLOGY AND VEGETABLE PATHOLOGY.

- No. 46. The Head Smut of Maize, by H. Godfrey Mundy, F.L.S.
- No. 58. Onion Thrips, by R. W. Jack, F.E.S.
- No. 66. Selection of Spraying Outfit, by R. W. Jack, F.E.S.
- No. 69. Resin Wash and Means of Applying It, by R. W. Jack, F.E.S.
- No. 75. Fumigation of Fruit Trees with Hydrocyanic Acid Gas, by R. W. Jack, F.E.S.

- No. 89. Insect Friends of the Farmer, by R. W. Jack, F.E.S.  
 No. 100. Tsetse—Preliminary Notes on the Habits of—by R. W. Jack, F.E.S.  
 No. 120. Some Insect Pests of Maize, by R. W. Jack, F.E.S.  
 No. 140. Insect Pests of Tobacco in Southern Rhodesia, by R. W. Jack, F.E.S.  
 No. 142. The Bean Stem Maggot, by R. W. Jack, F.E.S.  
 No. 147. Root Gallworn, by R. W. Jack, F.E.S.  
 No. 148. Darkling Beetle Grubs Injurious to Tobacco, by R. W. Jack, F.E.S.  
 No. 151. Potato Spraying Experiments for the Control of Early Blight, by Rupert W. Jack, F.E.S.  
 No. 154. Borers in Native Timber—Results of Experiments with Preservatives, by Rupert W. Jack, F.E.S.  
 No. 158. Two Ladybirds Injurious to Potato Plants, by R. W. Jack, F.E.S.

## VETERINARY.

- No. 50. Epizootic Abortion in Cattle, by Ll. E. W. Bevan, M.R.C.V.S.  
 No. 51. Strangles, by F. D. Ferguson, M.R.C.V.S.  
 No. 53. Animals Diseases Consolidation Ordinance, 1904.  
 No. 54. African Coast Fever, by Ll. E. W. Bevan, M.R.C.V.S. (revised edition).  
 No. 80. Detection and Prevention of Diseases of Stock, by Ll. E. W. Bevan, M.R.C.V.S.  
 No. 84. African Coast Fever—Diagnosis of Gland Puncture, by Ll. E. W. Bevan, M.R.C.V.S.  
 No. 91. Common Ailments of the Horse, by D. R. Chatterley, M.R.C.V.S.  
 No. 95. Oestrus-ovis in Sheep, by Alec King.  
 No. 103. Dipping and Tick-Destroying Agents, by Lt.-Col. H. Watkins-Pitchford.  
 No. 117. Ephemeral Fever or Three Days' Sickness in Cattle, by Ll. E. W. Bevan, M.R.C.V.S.  
 No. 121. Rabies, by Ll. E. W. Bevan, M.R.C.V.S., and T. G. Millington, M.R.C.V.S., D.V.H.  
 Conditions under which Government Veterinary Surgeons' Services are available to the public.

## MISCELLANEOUS.

- No. 10. Watering and Feeding of Live Stock on Railway.  
 No. 62. Services of Agricultural Engineer.  
 No. 77. Animals Diseases Amending Ordinance, 1911.  
 No. 90. Reports on Experiments—Experimental Station. Salisbury, 1910-1911, by J. H. Hampton.  
 No. 93. Formation of Agricultural Credit Associations in Rhodesia, by Loudon M. Douglas, F.R.S.E.  
 No. 96. Swine Breeds and Breeding of, by Loudon M. Douglas, F.R.S.E.  
 No. 98. Pig Breeding and Feeding, by T. M. Rixon.



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- No. 105. Bacon Curing on the Farm, by Loudon M. Douglas, F.R.S.E.  
 No. 108. Lime Deposits in Rhodesia and their Value, by G. N. Blackshaw, B.Sc., F.C.S.  
 No. 110. Utility Poultry Keeping, for Amateurs and Beginners, by "Gallinule."  
 No. 119. Some Notes on Charcoal Burning, by Eric A. Nobbs, Ph.D., B.Sc.  
 No. 123. Feeding and Care of Imported Bulls, by R. C. Simmons.  
 No. 127. Notes on the Building of Farm Homesteads, by R. C. Simmons.  
 No. 129. How to Make Use of the "Fencing Ordinance, 1904," by N. H. Chataway.  
 No. 134. Plans and Specifications for Flue Curing Tobacco Barns.  
 No. 141. Dry Season and Droughts in Rhodesia, by Rev. E. Goetz, S.J.  
 No. 143. Hints on Planting an Orange or Lemon Grove, by Chas. E. Farmer, Citrus Adviser to the British South Africa Company.  
 No. 144. Rhodesian Tobacco—Prospects of an Australian Market, by Eric A. Nobbs, Ph.D., B.Sc.  
 No. 145. Prospects for Importation of Cattle from Australia, by Eric A. Nobbs, Ph.D., B.Sc.  
 No. 146. Notes on Cattle Breeding, Part II., by R. C. Simmons.  
 No. 149. Dry Season and Droughts in Rhodesia (continued), by Rev. E. Goetz, S.J.  
 No. 150. Dry Season and Droughts in Rhodesia, by the Rev. E. Goetz, S.J.  
 No. 152. A School of Agriculture for Southern Rhodesia, by Eric A. Nobbs, Ph.D., B.Sc., Director of Agriculture.  
 No. 153. Citrus Fruit Trees—From Seed to Grove.  
 No. 155. The Manuring of Maize on the Government Experimental Farm, Gwebi, 1912-13.  
 No. 157. Hints on Brickmaking, by G. T. Dyke.  
 No. 159. Gwelo Creamery: Hints and Suggestions to Farmers, by W. G. Elliott.  
 No. 161. Notes on Cattle Breeding, Part III., by R. C. Simmons.  
 No. —. Orange and Lemon Growing in Southern Rhodesia, by R. McIlwaine.
- Health and Clothing.  
 Malaria: its History, Prevention and Cure, by A. M. Fleming, C.M.G., M.B., F.R.C.S. (Ed.), D.P.H. (Camb.), Medical Director.  
 Game Law: Summary of.  
 Terms for Analysis by the Department of Agriculture, of Produce, Soils, Water, etc.  
 Tree Culture in Southern Rhodesia, by P. B. S. Wrey, A.M.I.C.E.
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**HANDBOOK OF TOBACCO CULTURE** for  
 Planters in Southern Rhodesia. Sold by the Depart-  
 ment of Agriculture. 2/6.

## Employment on Farms.

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The Department of Agriculture receives numerous enquiries from persons of varied attainments, age and financial position for openings on farms, as managers, assistants and learners, requiring remuneration on corresponding scales, or willing to give services in return for keep.

In order that work may be found for the above and needs of farmers met, applications are invited from both employers and persons seeking employment. Applications are also invited from artisans, such as masons, bricklayers, carpenters, fencers, well sinkers, concrete workers, and the like who may desire work on farms. In cases where employers have obtained the labour they require, or applicants for employment have found work, it is requested that notification be at once sent to the Department of Agriculture, in order that unnecessary correspondence be avoided.

Replies to the following applications should be addressed to the initials of the advertisers, c/o Director of Agriculture, who will forward the letter to the party referred to.

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### SITUATIONS VACANT.

A. N.—Requires working partner to invest about £600 in farm near Salisbury. General farming, tobacco and cattle.

J. G.—Requires partner to invest capital and take active interest in farm near Salisbury. General farming, cattle and dairying.

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### SITUATIONS WANTED.

B. M.—As manager of tobacco farm.

B. O. M.—As manager of tobacco farm.

G. N.—Thorough experience in bacon curing, etc.

W. B. M.—As farm assistant; experience of dairying and fruit growing.

A. K. H.—As farm manager or assistant; three years' Rhodesian experience; cattle, dairy, general farming, and tobacco (air and flue curing). Thorough knowledge of machinery, tractors, etc., and repairs. Moderate salary and share.

A. V.—As manager or assistant; thorough knowledge of mixed farming, cattle, and fruit growing.

C. A. F.—Employment wanted by man, aged 40, with knowledge of tobacco, cotton and citrus growing, also general farming; references; salary required with percentage of crop.

G. W. D.—As manager or assistant on dairy farm; five years' experience; holding diplomas in dairying. Could invest some capital in suitable farm.

J. F. T.—Farm assistant; general farming and tobacco; moderate salary.

J. W. H.—Farm manager or assistant; general farming and tobacco; salary and share.

P. T.—As farm manager. Twenty years' Natal and Rhodesian experience; cattle, mixed agriculture and tobacco.

F. J. G.—As manager or assistant. Thorough knowledge of stock and general farming.

R. F. F.—Wants position as manager or assistant. Three years' experience; tobacco (air and flue curing), dairying and general farming. Excellent references. Salary and share by arrangement.



## Government Notices.

### ANIMALS DISEASES AMENDING ORDINANCE, 1911.

Ordinance No. 2, 1911.]

[Promulgated 17th March, 1911.]

BE IT ENACTED by the Administrator of Southern Rhodesia, with the advice and consent of the Legislative Council thereof, as follows :—

1. So much of the "Animals Diseases Consolidation Ordinance, 1904" (hereinafter referred to as the said Ordinance) and of any other law as may be repugnant to or inconsistent with the provisions of this Ordinance is hereby repealed.

2. The Administrator may, on the outbreak of a destructive disease, or when there is suspicion of the existence of such disease, declare an area around and including the place where such disease exists, or is supposed to exist, actively infected for the purpose of this Ordinance.

3. Whenever an area shall have been declared infected in terms of the last preceding section, the Administrator may, for the purpose of suppressing or controlling disease, cause such fences to be erected along the boundaries of or across any farms or land situated in such area as he may deem necessary.

4. (1) If the landowner shall not pay the cost of erecting any fence as aforesaid upon completion thereof, the cost shall be defrayed in the first instance out of moneys provided by the Legislative Council.

(2) When any fence erected as aforesaid runs along the boundary of a farm, the cost of the erection of such fence shall, if not sooner repaid, be repaid, together with interest at the rate of £5 per centum per annum, by equal yearly instalments commencing two years after the fencing is completed, such instalments being so calculated and fixed that the said cost and interest shall be wholly repaid within a period of fifteen years from the date when the first instalment became due.

(3) Such repayment shall be made by the adjoining landowners whose land has been divided by the fence. Each such landowner shall pay one-half the cost of the dividing fence and interest as aforesaid. When the adjoining land is a native reserve, or a portion of such reserve, the one-half of the cost shall be paid from funds in the local Treasury of the British South Africa Company.

(4) When any fence as aforesaid shall be erected within, and not on and along, the boundaries of any farm, the cost shall be paid from the funds of the local Treasury of the British South Africa Company, and the fence when no longer necessary for the purpose for which it was erected may be removed by the British South Africa Company; provided that the landowner shall have the right to purchase such internal fence at a price representing the total cost of such fence.

(5) The term "owner" shall mean (a) the person registered as such in the office of the Registrar of Deeds, (b) the British South Africa Company in respect of native reserves, and (c) the local Authority in respect of municipalities.

5. Where the bed of a stream or river lies immediately between or constitutes the boundaries of land owned by private owners, the fence may be erected on one or other bank of the river or stream and across it, or partly

on one bank, across it, and partly on the other bank, in such manner as may be agreed upon by the owners whose lands are separated by the said stream or river. The Administrator may call upon the said owners to agree to the position of the said fence on or before a date fixed by him, and, should they fail to do so, he may cause such fence to be erected without further reference to the said owners. For the purposes of repayment, such fence shall be considered as dividing the lands of adjoining owners, and half the cost shall be recoverable from each owner whose lands are separated by the said stream or river.

6. The Administrator may call upon any owner whose land has been fenced in terms of section 3 or 12 to provide sufficient security for the payment of any sums that may be due to the British South Africa Company in its local Treasury in respect of such fence. If the owner shall fail or refuse to provide such security, the Administrator may cause a notice in writing to be sent to the Registrar of Deeds of the amount due by such owner, and the Registrar shall make an entry thereof in respect of the land fenced. Such entry shall constitute an hypothecation of the land, ranking from the date on which the entry was made and for the amount therein stated; provided that the Registrar may pass transfer of land so hypothecated if the transferee agrees in writing that any sums due and unpaid shall remain and be registered as a charge against the said land.

7. When any land held under lease or permit of occupation has been fenced in terms of this Ordinance, during the term of such lease or permit the lessee or permit holder shall pay to the proprietor of such land yearly, during the continuance of the lease or permit of occupation, interest at the rate of £5 per centum upon so much of the cost of the fence as the proprietor is liable for, and such payment shall be made with the rent of the land, and shall be deemed in law to be part of such rent.

8. Any tenant or holder of land under a permit of occupation having a right to purchase such land at a fixed price shall, on completion of the purchase, pay to the proprietor, in augmentation and as part of the purchase money, any sum paid by such proprietor for the fencing of such land, and shall become and be liable to repay to the British South Africa Company in its local Treasury such sums as remain unpaid, as the same become due and payable in terms of this Ordinance.

9. Where in the case of any local authority the title to land provides that upon the sale thereof the British South Africa Company shall be entitled to receive a proportion of the purchase price, the local authority shall be entitled to deduct from the purchase price of land sold any debt due or amount paid by it in respect of fences on the land so sold erected under this Ordinance.

10. The provisions of sections 14 and 15 of the "Fencing Ordinance, 1904," in regard to repairs shall, *mutatis mutandis*, apply to fences erected in terms of this Ordinance.

11. Where a fence crosses any road used as of right by the public or by any neighbouring landowner, a properly constructed swing gate shall be placed at the point of crossing.

12. Any person opening such gate, except for the purpose of passing through, or omitting to close such gate after having passed through, and any person damaging such gate and omitting to immediately repair such damage shall be liable to a fine not exceeding £10, or in default of payment to imprisonment with or without hard labour for a period not exceeding one month.

13. The Administrator may, for the purpose of the more effective prevention or control of disease, apply the provisions of this Ordinance in respect of fencing to municipalities and townships and such land adjoining as may be deemed expedient, and to places within a radius of ten miles of an area declared actively infected in terms of section 2 hereof, if, owing to the number of cattle in such places, or other causes, it appears expedient.

14. (1) The owner or proprietor of the land along the boundaries of which fences have already been erected by the British South Africa Company for the purpose of preventing the spread of



African Coast Fever in cattle shall be and is liable to repay to the British South Africa Company in its local Treasury one-half of the cost of so much of the fence as may be along the boundary of such land. The provisions of sections 7 and 8 of this Ordinance shall apply in the case of land held under lease or permit of occupation along the boundaries of which fences have already been erected. The British South Africa Company may remove any such fence already erected which is within and not on or along the boundaries of any land when no longer necessary for the purposes for which it was erected.

- (2) Any payment due in respect of any such fence may be made as provided by section 4 of this Ordinance, and under the like conditions as to security for such payment as are prescribed under section 6.

15. Within any area declared by the Administrator to be actively infected under the provisions of section 2, or to which the provisions of this Ordinance shall have been applied in terms of section 12, the Administrator may for the purpose of more effectively preventing the spread of disease cause to be constructed on any land a dipping tank and any structures incidental thereto or other appliances for the dipping of stock, and may recover the expenditure incurred from the owner of the land on which such tank, structures or appliances have been constructed. The cost of such tank, structures or appliances shall be paid on the same terms and under the same conditions as are applicable to boundary fences under sections 4, 6, 7 and 8 of this Ordinance.

16. In addition to any penalties that may be imposed under the said Ordinance or any amendment thereof, or under any regulations framed thereunder for the unlawful movement of cattle, the Court of the Magistrate before which the case is tried or the High Court in the like instance may direct the confiscation of any cattle unlawfully removed, and such cattle, if infected with disease or likely to convey infection, shall be destroyed without compensation. Should there be no danger of infection the Administrator may order such cattle to be temporarily kept at any spot denoted by him and then sold. The proceeds of any such sale shall be paid to the British South Africa Company in its local Treasury.

17. Section 11, sub-section (1) of the said Ordinance is hereby repealed, and in lieu thereof the following shall be the section :—

“Should any Inspector, Sub-Inspector or any person specially authorised by the Administrator to carry out the provisions of this Ordinance know or suspect that any animal is infected with any destructive disease such Inspector, Sub-Inspector or other authorised person may forthwith place such animal in quarantine, together with such land as is necessary for its isolation, and such animals as have been or are suspected of having been in contact with such animal or with infection. Notice of such quarantine shall be given in writing to the owner or custodian of such animal and to the Magistrate of the district, and shall remain in force for such time as the Chief Inspector or Controller of Stock may direct, unless the Administrator shall sooner, if he thinks fit, issue the notice referred to in sub-section (2) of section 5. A copy of the notice of any such quarantine shall be posted at the office of the Magistrate, and shall be inserted by the Magistrate in some newspaper, if any, circulating in the district.”

18. Section 16 of the said Ordinance is hereby repealed, and in lieu thereof the following shall be the section :—

“Any Government Veterinary Surgeon or any person thereto authorised by the Controller of Stock, Chief Inspector or by a Magistrate may enter any land, building, kraal or enclosure for the purpose of inspecting animals. Should any animal be found to be infected with any destructive disease, or should such infection be reasonably suspected, he may quarantine such animals as in this



Ordinance provided, and may order the proper disinfection of any building, kraal or enclosure in which such animal is or may recently have been, and the furniture and fittings thereof. Should it be impossible to properly disinfect such stable, kraal or enclosure, furniture or fittings in any of them, he may order the destruction thereof; provided that no building, kraal or enclosure shall be destroyed unless the owner consents thereto in writing, or failing such consent, the Administrator orders that such destruction be carried out."

19. Section 22, sub-section (1) of the said Ordinance is hereby amended by the addition of the following words after the word "obtained" in the twelfth line of the said sub-section, "and any person receiving or taking delivery of any animals without having ascertained that such permit has been obtained."

20. This Ordinance may be cited as the "Animals Diseases Amending Ordinance, 1911," and shall be read as one with the "Animals Diseases Consolidation Ordinance, 1904," and the "Animals Diseases Amendment Ordinance, 1910."

No. 216 of 1912.]

[4th July, 1912.

#### REMOVAL OF CATTLE TO PRESCRIBED AREAS.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare that, notwithstanding the provisions of Government Notices Nos. 47 and 254 of 1910 and 51 of 1911 the removal of cattle to any point within twenty miles of the border of the territory defined by the Crocodile, Shashi and Ramaquabane Rivers, to the south-east beacon of Mphoeng's extension on the last named, may be allowed until further notice under permit from the Chief Inspector for the purposes of grazing and watering.

No. 50 of 1912.]

[8th February, 1912.

#### AFRICAN COAST FEVER.

*Regulations regarding the movement of cattle and the prevention and suppression of disease.*

1. UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw Government Notices Nos. 329 of 1910 and 308 of 1911 and make the following provisions in lieu thereof:—

2. The various districts of Southern Rhodesia are hereby declared an area infected with African Coast Fever for the purposes of section 5 (2) of the aforesaid Ordinance, and, save as hereinafter set out, all movement of cattle within the said districts is prohibited until further notice.

#### *General Movement.*

3. For the purpose of section 22 (1) of the said Ordinance, the following shall be regarded as places within the boundaries of which the movement of cattle may be allowed without special permission:—

- (a) Single farm.
- (b) Two or more adjoining farms, farmed together under one management and situated within one cattle transport area.
- (c) An area, the property of one owner, enclosed by a substantial fence.
- (d) For grazing purposes, an area within a radius of four miles of native kraals situated on unalienated land or in reserves, save and in so far as such area includes any private land.

The sites of such kraals shall be deemed to be the places where they are situated at the date of promulgation of these regulations.

4. Notwithstanding the provisions of the last preceding section, or of section 9 hereof, the Chief Inspector may, on the outbreak of disease, or for such other cause as may be deemed expedient, direct the isolation or quarantine of cattle on a limited area of the aforesaid places.

5. The movement of cattle from place to place may be permitted under the special permission, in writing, of an Inspector, Sub-Inspector, or other officer or person duly authorised by the Administrator to grant such permission.

6. No permission as aforesaid shall permit the movement of cattle—

- (a) Without the written consent of the owners, occupiers or managers of occupied land, and in the case of native reserves, of the Native Commissioner of the district over which land or reserve such cattle will pass, whether along roads or otherwise; provided, however, that refusal to grant such consent shall be in writing, and provided further that if the Controller of Stock or the Chief Inspector shall consider that such consent is withheld without good and sufficient cause he may permit of movement without such consent.

If any such person mentioned above refuse to give consent or to state a reason for refusing to do so in writing, no valid objection shall be deemed to exist and movement may be permitted without such written consent.

- (b) Within a veterinary district as defined in the Schedule annexed hereto from one transport area to or through another without the consent of the Cattle Inspector in charge of such area.
- (c) From any veterinary district to or through another without the consent of the District Veterinary Surgeon of such district.

#### *Slaughter Cattle.*

7. Cattle moved to any centre for slaughter under the provisions of these or any other regulations shall, on arrival, be immediately taken to such quarantine area (if any) as is provided for the purpose and immediately branded with the letters "V.D." on the near hip.

8. Cattle admitted to a quarantine area in terms of the last preceding section shall be slaughtered within twenty-one days of the date of admission, and shall not be permitted to leave the same except for the purpose of being slaughtered at the appointed abattoir, and if found outside such area, except for the said purpose, may be destroyed on the order of the Chief Inspector or Controller of Stock: provided, however, that the Chief Inspector may allow the removal of cattle from such an area under such conditions as he may prescribe.

#### *Transport Cattle.*

9. The use of cattle for draught purposes is prohibited except :—

- (1) Within the boundaries of the places defined in section 3 (a), (b) and (c) hereof.
- (2) Within the boundaries of areas already fixed for the use of cattle for draught purposes in terms of regulations published under Government Notice No. 329 of 1910, or such other areas as may be fixed by the Administrator.

10. Notwithstanding the provisions of section 9, no permit shall authorise the working of cattle

- (a) which are not clearly and distinctly branded with the registered brand of the owner;
- (b) in any wagon or vehicle which shall not have the owner's name and address legibly and permanently inscribed on the right side thereof.



11. No wagon or other vehicle drawn by oxen shall be moved from one cattle transport area into another without the permission of the Cattle Inspectors concerned, and under such conditions as they may impose.

*General Provisions.*

12. On the outbreak or suspected outbreak of disease, the Administrator may declare an area of infection around and embracing the place of outbreak or suspected outbreak, and a further area or areas around such area of infection as a guard area, whereupon all movement of cattle into and from place to place within such area or areas shall be immediately suspended, except as hereinafter provided.

*A.—In areas of infection and guard areas:—*

- (1) Cattle in transit by rail may be moved through such area.
- (2) Cattle from beyond the borders of Southern Rhodesia may be detained within such area or areas *en route* to destination.
- (3) Cattle for *bona fide* farming, dairy and slaughter purposes may be moved into such area or areas by permission of the Chief Inspector and under such conditions as he may impose.

*B.—In guard areas only:—*

Cattle may be moved into and from place to place within such area under the conditions of section 6 hereof.

13. The removal of green forage, hay, fodder, bedding reeds, manure or of such other articles as may be reasonably supposed capable of conveying infection, shall be prohibited from areas of infection, save and except with the special permission of the Administrator.

14. Whenever an area shall have been declared under section 12 hereof, every person within such area, or within such further area as may be specified by Government Notice, owning or in charge of cattle shall, upon the death or slaughter because of disease, suspected disease, or accident, of any such cattle, immediately report such occurrence through the nearest Cattle Inspector, Native Commissioner or Police Officer to the District Veterinary Surgeon.

15. Notwithstanding the provisions of these regulations, it shall be competent for the Chief Inspector of Cattle to authorise and direct the movement of cattle for the purposes of isolating, dipping, quarantine, or any other such objects as may be deemed necessary to prevent or suppress an outbreak of disease.

16. Whenever an area shall have been declared an area of infection or guard area in terms of section 12 hereof, any person who shall allow any cattle to stray or be otherwise removed, except as provided for in these regulations, from any one place within such area to another place, or from a place outside of to a place within such area, shall be guilty of an offence against these regulations.

17. All cattle within the limits of the various commonages and townlands, areas of infection and guard areas as declared under section 12 hereof, or depastured on common grazing ground, shall be dipped or sprayed at least once in every three days, unless the Chief Inspector shall authorise the extension of the time between such dipping or spraying, or the entire suspension of the same.

18. In all areas of infection and guard areas sheep and goats shall be dipped at such periods as may be directed by the Chief Inspector.

19. Whenever the owner, occupier, or manager of a farm shall adopt means of cleansing cattle running thereon, either by spraying, dipping, or by any other method, the Chief Inspector may order any natives or other persons having cattle on the same farm to cleanse such cattle, and the Native Commissioner of the district within which the farm is situated may enter into an arrangement with the native owners of cattle to cleanse such cattle at a charge to be mutually agreed upon between the said owner, occupier or manager and the said native owners.



20. All permits for the removal of cattle issued under the provisions of the said Ordinance or of any regulations framed thereunder shall specify legibly and clearly on the face thereof the place from and to which such cattle may be removed, the route by which they shall travel, the number and brands of such cattle, the time allowed for the journey, and such other particulars and conditions as it may be deemed expedient to provide.

21. No permit issued for the movement of cattle shall be taken to authorise any trespass in connection with such movement.

22. Notwithstanding the provisions of these regulations, it shall not be lawful for any owner of cattle to allow any such cattle to be on any road, public outspan, commonage, or any property other than that of the owner, unless they are free from ticks or unless they have been effectively cleansed by dipping, spraying or other process, within fourteen days of being allowed on such road or other place. Any beast having ten or more ticks on it shall not be considered free from ticks.

23. Any person contravening the provisions of these regulations or the conditions set out in permits issued thereunder, shall, where no higher penalty has been by the said Ordinance or any other law provided, be liable in respect of each offence to a fine not exceeding £20, or in default of payment to imprisonment with or without hard labour for a period not exceeding three months.

#### SCHEDULE "A."

##### VETERINARY DISTRICTS OF SOUTHERN RHODESIA.

###### (1) *Salisbury.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912 :—

32. Battlefields; 33. Hartley and Gatooma; 34. Gadzema Station; 35. Makwiro Station; 36. Norton Siding; 37. Hunyani Tank; 38. 1645½ Peg B. & M. & R. Railways; 39. Salisbury A.; 40. Salisbury B.; 41. Salisbury C.; 42. Salisbury D.; 43. Arcturus; 44. Bromley; 45. Marandellas North; 46. Marandellas South; 48. Headlands Station; 49. Junction Mazoe and Lomagundi Railways; 50. 23-Mile Peg, Lomagundi Railway; 51. Passaford Station; 52. 35-Mile Peg, Lomagundi Railway; 53. Gwibi Tank Halt; 54. Banket, Lomagundi; 55. Eldorado, Lomagundi; 56. Selby Siding; 57. Mazoe; and 58. Kimberley Reefs.

###### (2) *Bulawayo.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912 :—

1. Plumtree; 2. Marula Siding; 3. Figtree; 4. Westacre Junction; 5. Bulawayo Area; 6. Heaney Junction; 7. Bembesi Station; 8. Insiza North; 9. Insiza South; 10. Shangani North; 11. Shangani South; 14. Redbank; 15. Nyamandhlovu Station; 16. Malindi Station; 17. Wankies Area; 18. Matetsi Siding; 19. Matopo Terminus; 20. Sabiwa Siding; 21. Gwanda Station; 22. West Nicholson; 23. Belingwe; 59. Essexvale and Balla Balla Areas; 60. Stanmore Siding Area; 61. Filabusi Area.

###### (3) *Gwelo.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912 :—

12. Somabula Siding; 13. Gwelo Station; 24. Selukwe Area; 25. Surprise Area; 26. Indiva Siding; 27. Lalapanzi; 28. Iron Mine Hill Siding; 29. Umvuma Siding; 31. Que Que Station.

###### (4) *Umtali.*

An area comprising the native districts of Umtali, Melsetter, Makoni and Inyanga.

No. 189 of 1912.]

[6th June, 1912.

## REMOVAL OF CATTLE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare that, notwithstanding the provisions of section 12 of Government Notice No. 50 of 1912, the removal of cattle for purpose of obtaining food or water may be permitted at the discretion of the Chief Inspector, and under such conditions as he may prescribe.

No. 175 of 1912.]

[30th May, 1912.

## AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that, notwithstanding the provisions of Government Notices Nos. 47 and 254 of 1910 (and 51 of 1911), the removal of cattle to within that portion of the prescribed areas westward of the Salt River, Tuli district, may be allowed under permit from the Chief Inspector, for the purposes of grazing and watering.

No. 233 of 1912.]

[11th July, 1912.

## AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw Government Notice No. 127 of 1910, in so far as it relates to the Protectorate of Nyasaland, and further do hereby prohibit the introduction into Southern Rhodesia of cattle from Nyasaland until further notice.

No. 82 of 1913.]

(As Amended.)

[13th March, 1913.

## AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Government Notices Nos. 338 of 1912 and 13 of 1913, and, in terms of section 12 of Government Notice No. 50 of 1912, declare the following areas of infection and guard areas for the purposes of the said Ordinance :—

- (1) THE NATIVE DISTRICTS OF BULAWAYO, MATOBO, BULALIMA-MANGWE AND BUBI.

*Area of Infection.*

The farms Collaton, Irene, Mabogutwaneni Outspan, and within a radius of four miles of Inyamba's Kraal on Alnwick Estate.

*Guard Areas.*

(a) An area bounded by and including the following farms :—Alnwick Estate, Joe's Luck, Honeybird Kop, Doublevale, Maritzburg, Springvale, Outspan No. 3 Tati Road, Vregevecht, La Concorde, Lucydale, Lonsdale, and the fenced north-western section of Westacre Creek.

(b) The fenced sub-division of Bulawayo Commonage which includes the township, suburbs and Hillside.

(c) The farm Induba.

## (2) NATIVE DISTRICT OF SALISBURY.

(a) *Areas of Infection.*

- (1) Hatfield Estate and Hatfield Estate plots;
- (2) Salisbury commonage;
- (3) the southern portion of the farm The Grange.

(b) *Guard Area.*

An area bounded by and including the following farms:—Zizalisari Outspan, Thorn Park, Komani, Good Hope, Hayden, Stamford, Gillingham, Park Ridge, Willowvale, Hopley, Saturday Retreat, Odar Outspan, Stoneridge, Eyrecourt, Boutelle, Twentydales, Deanesbrook, Galway Estate, Sebastapool, Caledonia, Father Hartmann's, Chishawasha, Glen Lorne, Borrowdale Estate and Teviotdale.

## (3) NATIVE DISTRICT OF UMTALI.

(a) *Area of Infection.*

Umtali Commonage.

(b) *Guard Area.*

The farms Devonshire, Quagga's Hoek, Fern Valley and Fern Hill.

No. 123 of 1913.]

[24th April, 1913.]

## AFRICAN COAST FEVER.

WHEREAS there has been an outbreak of a destructive disease, to wit, African Coast Fever, on the Hatfield Estate Plots, I, under and by virtue of the powers vested in me by the "Animals Diseases Amending Ordinance, 1911," do hereby declare the following area in the native district of Salisbury to be an area actively infected with African Coast Fever for the purposes of the said Ordinance:—

An area bounded by and including the following farms:—Makabusi Outspan, Hopley, Saturday Retreat, Odar Outspan, Stoneridge, Eyrecourt, Boutelle, Twentydales, Glenwood, Adelaide, Ventersburg, Makabusi, Gallagher's, M.T.C., Hatfield Estate, Hatfield Estate Plots, Prospect and Ardennie Township.

No. 143 of 1913.]

[15th May, 1913.]

## AFRICAN COAST FEVER.

I DO hereby, in terms of section 12 of the regulations published under Government Notice No. 50 of 1912, declare the following area of infection and guard area for the purposes of the said regulations:—

(a) *Area of Infection.*

The farms Inodzi, Nyagari, Mountain Home (The B.), Umtali Mission and the Penhalonga Valley.

(b) *Guard Area.*

That portion of the native district of Umtali bounded on the south by a line running from the Odzi River along the south-western boundaries of the farms Odzi Junction, Grange, and Premier Estate, and the northern boundaries of the farms Devonshire, Wiermouth and Umtali Commonage to the Anglo-Portuguese boundary.

No. 297 of 1913.]

[2nd October, 1913.]

## AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby, in terms of section 12 of Government Notice No. 50 of 1912, declare the farm Haydon, in the native district of Salisbury, to be an area of infection.



No. 298 of 1913.]

[2nd October, 1913.]

## AFRICAN COAST FEVER.

WHEREAS there has been an outbreak of a destructive disease, to wit, African Coast Fever, on the farm Haydon, in the native district of Salisbury, I, under and by virtue of the powers vested in me by the "Animals Diseases Amending Ordinance, 1911," do hereby declare the above-mentioned farm to be an area actively infected with African Coast Fever for the purposes of the said Ordinance.

No. 325 of 1913.]

[13th November, 1913.]

## AFRICAN COAST FEVER.

WHEREAS there has been an outbreak of a destructive disease, to wit, African Coast Fever, on the farm Mabonda, in the native district of Umtali, I, under and by virtue of the powers vested in me by the "Animals Diseases Amending Ordinance, 1911," do hereby declare the surrounding farms, Epsom, Sheba, Drennan, Banks and Coldstream, to be areas actively infected with African Coast Fever for the purposes of the said Ordinance.

No. 326 of 1913.]

[13th November, 1913.]

## AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby, in terms of section 12 of Government Notice No. 50 of 1912, declare the farm Mabonda, in the native district of Umtali, to be an area of infection.

No. 145 of 1913.]

[15th May, 1913.]

## FEES FOR DIPPING CATTLE AT GOVERNMENT DIPPING TANKS.

UNDER and by virtue of the powers vested in me by section 5, subsection 6 (e), of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare that a charge of one penny per head will be made in respect of all cattle dipped at Government dipping tanks. Unweaned calves will be dipped free of charge.

No. 342 of 1912.]

[24th October, 1912.]

## TRANSPORT AREAS.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby, in terms of section 9 of the Regulations published under Government Notice No. 50 of 1912, declare that, until further notice, the main road between the Tokwe and Ngesi Rivers is included in Area No. 24, Government Notice No. 11 of 1912, and the use of cattle for draught purposes is therefore permitted up to the Ngesi River upon the said road.

No. 392 of 1912.]

[19th December, 1912.]

## TRANSPORT AREAS.

WHEREAS it is desirable to afford facilities for a limited amount of transport with cattle from Shangani Station to the Native Commissioner's Office in the Belingwe district, I, under and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," do hereby, notwithstanding any regulations to the contrary, authorise the Chief Inspector to permit of such transport under such terms and conditions in writing as to him may seem fit.

No. 22 of 1913.]

[16th January, 1913.]

## MOVEMENT OF CATTLE.

IT is hereby notified for general information that, in terms of section 5 of the regulations published under Government Notice No. 50 of 1912, I do

hereby authorise Native Commissioners and Assistant Native Commissioners to issue permits for the movement of cattle from place to place, in conformity with the provisions of the said regulations.

No. 110 of 1908.]

[16th April, 1908.]

### IMPORTATION OF CATTLE.

UNDER and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal so much of the Regulations published under Government Notice No. 187, dated the 26th of July, 1906, as relate to the importation of cattle from the Colony of the Cape of Good Hope and the United Kingdom of Great Britain and Ireland, and make the following provisions in lieu thereof:—

1. The importation of cattle may be permitted from the Colony of the Cape of Good Hope and the Orange River Colony on the following terms and conditions—

- (1) A permit shall be required from the Chief Inspector which may contain such conditions as shall from time to time appear expedient.
- (2) Applications for permission to import shall be in the Form "A" attached hereto, and accompanied by a declaration in the annexed Form "B"
- (3) The importation of cattle with more than two permanent central incisor teeth shall not be permitted.
- (4) All importations shall be by rail and for the purposes thereof Bulawayo shall be regarded as the port of entry.
- (5) All cattle imported in terms of these Regulations shall on arrival at Bulawayo, Salisbury, or Umtali be removed to a place of quarantine under the supervision of an Inspector of Cattle, there to be submitted to such examination and tests as the Chief Inspector may direct. If such examination or tests disclose the existence of any destructive disease the cattle shall be immediately destroyed and the carcasses thereof disposed of in such manner as a Government Veterinary Surgeon may authorise or require. The Chief Inspector may permit of any examination or tests as aforesaid being dispensed with in the case of cattle in transit by rail for any place beyond the boundaries of Southern Rhodesia.
- (6) All expenses or losses incident to quarantine, examination, testing or destruction as aforesaid shall be borne by the owner of the cattle.

2. The importation of cattle from the United Kingdom of Great Britain and Ireland may be permitted under the following terms and conditions—

- (1) Importation shall be through and direct from the coast ports of the Cape Colony, and there shall be a consignment note or other satisfactory evidence that cattle so imported have come direct from Great Britain or Ireland.
- (2) The provisions of sub-sections (5) and (6) of section 1 hereof shall apply to importations in terms of this section.

3. No person shall import cattle in terms of these Regulations except for his own use, provided however that permission may be granted to import for others on the applicant disclosing the name of the person or persons for whom he proposes to act.

4. Any person introducing cattle in contravention of these Regulations, or failing to comply with any conditions attached to permits to import, or furnishing applications, declarations, or other necessary documents known to be false in any material particular, or failing to comply with all lawful

directions as to quarantine, examination, testing, destruction or disposal of carcasses, shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties shall have been provided for such offences by the "Animals Diseases Consolidation Ordinance, 1904," provided however that the penalties imposed by these Regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

## ANNEXURE "A."

## APPLICATION FOR CATTLE IMPORTATION PERMIT.

1. Applicant's Name and Address.....
2. Number and Class of Cattle to be imported.....
3. Area or Farm and District where Cattle are at present located.....
4. Area or Farm and District to which Cattle are to be moved.....

Applicant's Signature.....

Date.....

Application.....

Permit No.....

## ANNEXURE "B."

I, ..... residing on the farm ..... in the district of ..... do solemnly and sincerely declare that the ..... (number in writing) animals also enumerated below have been in my possession since birth, and that Lung sickness (Contagious Pleuro-Pneumonia) has not existed amongst any of my cattle, nor on my farm, during the last four years, and that no other bovine disease scheduled under the Diseases of Stock Act, 1911 (Union of South Africa) has existed amongst any of my cattle, nor on my farm, during the last twelve months, and that these animals have never been exposed for sale in any public market or stock fair.

Number of Animals ..... Bulls ..... Heifers .....  
Breed .....

Seller's Name and Address .....

Purchaser's Name .....

Place in Southern Rhodesia to which animals are being sent .....

And I make this solemn declaration conscientiously believing the same to be true.

Declared to at ..... on this ..... day of.....  
before me,

Resident Magistrate for the District of .....

No. 127 of 1910.]

[2nd June, 1910.

## IMPORTATION OF CATTLE FROM NORTH-EASTERN RHODESIA.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that the importation of cattle from North-Eastern Rhodesia may be permitted under the following terms and conditions:—



1. The permission of the Chief Inspector of Cattle be first had and obtained.

2. All cattle shall be introduced by way of the town or port of Feira, which is hereby declared a port of entry.

3. All applications for permission to import shall be accompanied by—

(1) A certificate by a Government Veterinary Surgeon of the territory of origin that—

a. the districts from which they come and through which they pass are free from contagious diseases of animals;

b. the animals in respect of which the application is being made have been examined and are free from any destructive disease.

4. All cattle shall on entry be taken to a quarantine area defined by the Chief Inspector of Cattle, and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, not less than three months.

5. Cattle at Feira at the date of promulgation of this notice may be removed to the quarantine area on permission of the Chief Inspector of Cattle without the certificates detailed above.

6. Any person found introducing cattle in contravention of these regulations, or failing to comply with any of the conditions attached to permits to import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties have been provided for such offence by the "Animals Diseases Consolidation Ordinance, 1904"; provided, however, that the penalties imposed by these regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

#### SCHEDULE "A."

##### 1. CERTIFICATE UNDER SECTION 3. (1), a.—

I hereby certify that I have examined the following cattle belonging to Mr. ....

..... Cows and heifers,

..... Calves,

..... Oxen and bulls,

and that the districts from which they come and through which they will pass in this territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signature .....

Government Veterinary Surgeon.

##### 2. CERTIFICATE UNDER SECTION 3. (1), b.—

I hereby certify that I have examined the following cattle belonging to Mr. ....

..... Cows and heifers,

..... Calves,

..... Oxen and bulls,

In my opinion these animals are free from all destructive diseases.

Signature .....

Government Veterinary Surgeon.

No. 60 of 1913.]

[13th February, 1913.]

## IMPORTATION OF CATTLE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby authorise the importation from the Kingdom of the Netherlands of cattle required for *bona fide* breeding purposes; provided, however, that such importation shall *mutatis mutandis* be subject to the provisions of Government Notice No. 110 of the 16th April, 1908, relating to the importation of cattle from the United Kingdom of Great Britain and Ireland.

No. 47 of 1913.]

[6th February, 1913.]

## IMPORTATION OF SHEEP, GOATS AND PIGS.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare that the introduction of sheep, goats and pigs against which no prohibition exists may be permitted from overseas, *via* the port of Beira, under the following conditions :—

- (1) Umtali shall be the port of entry;
- (2) that all such importations shall be in accordance with the regulations now in force or as amended from time to time;
- (3) that all animals shall be transferred directly after disembarkment to the railway trucks at Beira and conveyed thence to Umtali without leaving the said trucks.

## REGULATIONS UNDER WHICH STOCK IS ALLOWED TO PASS IN TRANSIT THROUGH THE TERRITORY OF THE MOZAMBIQUE COMPANY.

WITH reference to Government Notice No. 47 of 1913, the conditions under which stock is allowed to pass in transit through the territory of the Mozambique Company are published below for public information :—

(By "stock" is meant : horses, cattle, mules, donkeys, sheep, goats, pigs and dogs.)

I. The Customs official shall not allow disembarkation of any kind of stock at the port of Beira, when the said stock is in transit to Rhodesia, before a written permission from the Veterinary Department stating therein that disembarkation can take place.

II. In order to obtain this permit, mentioned in the foregoing article, the owner or his representative, who may be his Custom house broker, must have a written application for such permit, to the Chief Veterinary Surgeon of the Companhia de Mocambique, giving at the same time the following particulars, in writing :—

- (a) the number of heads of stock to be landed;
- (b) kind of stock;
- (c) what country the stock comes from, giving the name of the region;
- (d) the destination of such stock.

III. The importer, or his representative, must present at the same time the following certificates :—

- (a) one certificate from a Veterinary Surgeon of the country of origin of the said stock, stating that the region is free from any epizootic disease and that all the animals are also free from any such diseases;

- (b) a certificate signed by the captain of the ship which brought the stock, stating the number of deaths, if any, which have occurred during the voyage and if possible the cause of death.

IV. Having received the above-mentioned certificates and the information required by the foregoing articles, one of the Veterinary Surgeons of the Companhia de Mocambique, or their substitute, will proceed to inspect the stock on board the ship.

V. If during the inspection the Veterinary Inspector suspects the presence of any contagious disease, he will with the least possible delay investigate the case, and if his suspicions are confirmed and he has reason to believe that the disease in question might spread within the Territory of the Companhia de Mocambique, he shall refuse to issue the permit referred to in Article I. of this order.

VI. If after the inspection the Veterinary Surgeon or his substitute is satisfied that there is no danger in allowing such stock to pass through the Territory in transit, he shall issue the permit referred to in Article I. of this order.

VII. The Chief of the Customs Department, having received the permit referred to in Article I., shall allow disembarkation of the said stock under the following conditions :—

- (a) the only means by which any stock can be taken through the Territory is by rail;
- (b) that the stock should be taken directly after the disembarkation from the lighters to the railway station and placed in wagons or trucks. The windows and other openings for ventilation in the wagons should be covered up with wire netting, the meshes of which are small enough to prevent the entrance of biting flies, etc. ;
- (c) having once been entrained, the animals will not be allowed to leave those wagons or trucks whilst they are in the Territory of the Companhia de Mocambique;
- (d) that any forage or hay that may be landed for the use of the stock to which this order refers, if not utilised for the purpose, will be burnt if between the time of disembarkation and the departure of the stock by train it has not been consumed, despatched or re-exported.

Any contravention of this order shall be considered a transgression, and as such be dealt with according to No. 3 of Article 74 of the Customs Regulations in force.

The authorities and every one whom it may concern to abide by and obey.

No. 211 of 1910.]

[4th August, 1910.

#### IMPORTATION OF CATTLE FROM NORTH-WESTERN RHODESIA.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that, notwithstanding the prohibition contained in Government Notice No. 89 of 1908, the importation of cattle from North-Western Rhodesia may be permitted under the following terms and conditions :—

1. The permission of the Chief Inspector of Cattle shall be first had and obtained.



2. All cattle shall be introduced (a) by rail via the Victoria Falls, or (b) by way of the town or port of Feira, which are hereby declared to be ports of entry.

3. All applications for permission to import shall be accompanied by a certificate by a Government Veterinary Surgeon of North-Western Rhodesia that—

- (a) the districts from which they come and through which they pass are free from contagious diseases of animals;
- (b) the animals in respect of which the application is being made have been examined and are free from contagious diseases of animals.

4. All cattle shall on entry be taken, where possible by rail, to such quarantine area and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, but not less than three months.

5. Any person found introducing cattle in contravention of these regulations, or failing to comply with any of the conditions attached to permits to import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months; provided, however, that the penalties imposed by these regulations shall not exempt from liability to penalties, forfeiture, or destruction, elsewhere provided for

#### ANNEXURE "A."

##### *Certificates under Section 3.*

(a) I hereby certify that I have examined the following cattle belonging to Mr. ....

.....cows and heifers,  
 .....calves,  
 .....oxen and bulls,

and that the districts from which they come and through which they will pass in this Territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signed.....  
 Government Veterinary Surgeon.

(b) I hereby certify that I have examined the following animals belonging to Mr. ....

.....cows and heifers,  
 .....calves,  
 .....oxen and bulls.

In my opinion these animals are free from all destructive diseases.

Signed.....  
 Government Veterinary Surgeon.

NOTE.—All numbers are to be expressed in words.

### IMPORTATION OF STOCK FROM THE PROVINCE OF THE CAPE OF GOOD HOPE.

WITH reference to Departmental Notice of 28th February, 1912, it is hereby notified that the said Notice is cancelled, and importation of stock will now be permitted, in terms of Government Notice No. 110 of 1908, from the Province of the Cape of Good Hope, with the exception of the following districts :—

Komgha  
East London

Peddie  
Victoria East  
Kingwilliamstown  
Stutterheim  
Cathcart

Stockenstrom  
Queenstown (Gwatyu Ward  
only)  
Glen Grey  
Maclear  
Elliot Slang River  
Wodehouse  
Barkly East

No. 375 of 1912.]

[28th November, 1912.]

### IMPORTATION OF POULTRY.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," as amended by the "Animals Diseases Amendment Ordinance, 1910," I do hereby declare and make known that the following regulations shall be in force and effect from date of publication hereof :—

(1) All poultry imported by rail shall be inspected by an Inspector or Sub-Inspector at Plumtree, Bulawayo or Umtali.

(2) Should any consignment of poultry shew symptoms of disease, or should such Inspector or Sub-Inspector have reason to believe that any disease exists in, or that infection is likely to be conveyed by such consignment, he may order the detention and isolation of the whole consignment for such period as he may deem necessary.

(3) The Chief Inspector may order the destruction of all poultry which he has reasonable grounds for believing to be diseased or likely to convey infection.

No. 391 of 1908.]

[17th December, 1908.]

### BRANDS ORDINANCE AMENDMENT ORDINANCE, 1908.

UNDER and by virtue of the powers vested in me by the "Brands Ordinance, 1900," as amended by the "Brands Ordinance Amendment Ordinance, 1908," I do hereby cancel and withdraw the Regulations published under Government Notice No. 204 of 1900, and declare the following shall be in force in lieu thereof, from and after the 7th January, 1909 :—

1. The Registrar of Brands shall have his office in the Agricultural Department. With the exception of the Magistrate of Salisbury, the Magistrate in each district of Southern Rhodesia, and the Assistant Magistrate in each sub-district, shall be a deputy Registrar of Brands for the magisterial district or sub-district to which he is appointed. The offices of the Deputy Registrars of Brands shall be the offices of the several Magistrates.

2. (a) The form of application for registration of a brand shall be that marked "A" in the Schedule attached to this Notice.
- (b) The form of a certificate of registration shall be that marked "B" in the said Schedule.
- (c) The form of a transfer of a brand from one registered proprietor to another shall be that marked "C" in the said Schedule.
- (d) The form of a certificate of such transfer shall be that marked "D" in the said Schedule.

3. Each Deputy Registrar of Brands shall keep a register, in the form of Schedule "E" hereto, of all brands allotted within his district under the provisions of the Ordinance.

4. Save as hereinafter provided, every registered brand shall consist of two letters and a numeral of plain and uniform pattern; and the first of the letters shall indicate the magisterial district or sub-district in which the holding is situate on which the brand is to be used, and shall be placed above the numeral and letter comprising the brand, so as to be in triangular form.

5. One brand and no more shall be allotted to any person in one magisterial district or sub-district.

6. The size of the characters branded on stock shall not be more than three inches in height nor more than two inches in width.

7. An applicant for a brand shall be allotted the next vacant brand assigned to the district in which he is located, as set forth in Schedule "F" hereof.

8. Each Deputy Registrar shall keep a list of brands assigned to his district, for the inspection of applicants for brands.

9. There shall be payable to the Registrar or Deputy Registrar—

(a) For every separate registration of a brand, 5s.

(b) For every transfer of a brand, 5s.

10. All brands shall be imprinted on stock as follows:—

(a) In the case of horses, mules or donkeys, the first brand shall be imprinted either on the near side of the neck or near rump, and any second or subsequent brand shall (where there is sufficient space for such purpose) be imprinted on the same part of such animal, and at a distance of not less than one and a half inches from and directly underneath last imprint, according to the table herein set forth.

Where there is not sufficient space for the purpose, then such second or subsequent brand shall be imprinted on the part of such animal next in order, according to the following table:—

- i. Off Neck or Rump (or Thigh);
- ii. Near Shoulder (or Top of Arm);
- iii. Off Shoulder (or Top of Arm).

(b) In the case of cattle, the first brand shall be imprinted on the near rump or thigh of the animal, and every second or subsequent brand shall be imprinted at a distance of not less than one and a half inches from and directly underneath the brand last imprinted, according to the following table:—

- i. Off Rump (or Thigh);
- ii. Near Shoulder (or Top of Arm);
- iii. Off Shoulder (or Top of Arm).

(c) In the case of sheep and goats, the first brand shall be imprinted on the near shoulder, and all second or subsequent brands in the following order:—

- i. On Near Side or Ribs;
- ii. Near Rump (or Thigh);
- iii. Off Shoulder;
- iv. Off Side or Ribs;
- v. Off Rump (or Thigh).

(d) In the case of ostriches:—

- i. On Near Thigh;
- ii. On Off Thigh.



11. Each proprietor of a registered brand shall have the right, in addition to imprinting his brand in the manner above prescribed, to place such brand on the ears of such animals by punching, tattooing or ear-rivets.

12. The owner of any brand may surrender the same, and the Registrar shall, on receipt of notice thereof, cancel the registration by notice in the *Gazette*.

13. When it appears to the Registrar, upon the report of a Deputy Registrar, Native Commissioner, or Cattle Inspector, that a registered brand is not in use, he may cause notice thereof to be given to the owner thereof, calling upon him to shew cause why the same should not be cancelled; if cause is not shewn to the satisfaction of the Registrar within six months after such notice, he may cancel the brand.

14. No brand which has been surrendered or cancelled shall be re-allotted until a period of five years from such surrender or cancellation has elapsed.

15. The Registrar shall, at the end of each quarter in every year, or as soon thereafter as possible, transmit for publication in the *Gazette* a statement, in the form of Schedule "E" hereto, of all brands registered under the Ordinance up to the last day of such quarter.

16. The Registrar shall allot a brand to every public pound already or hereafter to be established, and shall register the same.

The first character of every such brand shall be a diamond, and the second the dominant letter of the magisterial district or sub-district, and the third a numeral, the dominant letter to be placed above the diamond and numeral, so as to form a triangle; and the Poundmaster shall, on sale of any stock impounded therein, brand the same with such brand on the portions and in the order prescribed in these Regulations, to shew that the said brand is the last brand at that time imprinted on such stock; and any Poundmaster who shall fail to comply with the provisions of this section shall on conviction be liable to a fine not exceeding £5.

No. 396 of 1912.]

[26th December, 1912.]

#### RABIES.

UNDER and by virtue of the powers vested in me by section 59 of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare all the districts of Southern Rhodesia to be an area coming under the operation of Part VI. of the said Ordinance, and I do further hereby publish the subjoined regulations for preventing the spread of the disease known as rabies:

1. The regulations published under Government Notice No. 45 of 1909, as amended by Government Notices Nos. 284 of 1911 and 260 of 1912, are hereby repealed, but nothing herein contained shall affect the validity of current notices issued by the Administrator in terms of the said regulations.

2. Any Magistrate, Police Officer, Native Commissioner, Government Veterinary Surgeon, or other official vested with the performance of functions under the "Animals Diseases Consolidation Ordinance, 1904," may on its appearing to him that any dog or other animal is shewing symptoms which justify investigation as to whether such dog or animal is suffering from rabies or not, order the proper detention, isolation and control of such dog or animal, either in the hands of the owner or at some other suitable place.

3. Should any dog shew symptoms which lead to the suspicion that such dog may be suffering from rabies, the owner thereof shall forthwith notify the fact to the nearest official vested with powers under these regulations, who shall immediately report the same to the Chief Veterinary Surgeon, and shall either destroy the said dog or isolate and secure it for further observations.

4. On its appearing that any animal is actually suffering from rabies, any of the above-mentioned officials may order the destruction of such animal, or may himself destroy it, and may further take control of or destroy, if deemed necessary, any animal which has been in contact with a rabid animal or an animal suspected of being rabid.

5. The carcasses of all animals destroyed on account of their being infected with rabies shall be thoroughly burnt by the person or official destroying them, save that such parts as may be required for scientific investigation may be retained under proper precautions. In any case in which a human being has been bitten by a rabid animal, the head of such animal shall, if possible, be taken and sent to the nearest veterinary official.

6. (1) In the event of an outbreak of rabies occurring, the Administrator may, by notice in the *Gazette*, direct that all dogs within a radius of fifteen miles of such outbreak, or such other area as may be fixed, shall be kept in a safe enclosure or chained up for a period of not less than six weeks from such notification, or such other period as may be fixed, but may be taken out for exercise if kept on a chain or leash by the person exercising them.

(2) In the event of a suspected outbreak of rabies occurring, the Magistrate of the district may, and at the request of the Chief Inspector of Stock shall, direct that all dogs within a radius of fifteen miles, or such other area as may be deemed necessary, shall be kept in a safe enclosure or chained up for a period not exceeding four weeks, but may be taken out for exercise if kept on a leash or chain by the person exercising them.

(3) No dog shall be removed from any proclaimed area during such period of quarantine.

7. Notwithstanding the provisions of section 6 (1) and (2), packs of foxhounds, harriers, or beagles, duly registered as such before the Magistrate of the district in which their owner or owners reside, may be used for the purposes of the chase when under the ordinary supervision and control of not less than two persons engaged in the chase.

8. Any person contravening any of the above regulations, or failing to carry out any of the provisions thereof, shall be liable, on conviction, to a fine not exceeding £10 for each offence; or, in default of payment, to imprisonment with or without hard labour for a period not exceeding one month.

9. These regulations shall come into operation on the 1st day of January, 1913.

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No. 336 of 1911.]

[26th October, 1911.

#### RABIES.

THE following instructions regarding the treatment of persons bitten by rabid animals are published for general information.

In every case where a person has been bitten by a dog or other animal known or suspected to be rabid, the following precautions are recommended :—

- (1) The wound should be immediately and thoroughly cauterised. This, if it does not altogether prevent the disease, delays its onset sufficiently for Pasteur treatment to be successfully applied.
- (2) The patient should be sent to Salisbury for treatment at once. Delays are dangerous.
- (3) The fullest information should be sent to the Health Department as to date when bitten, locality, fate of dog, and especially reasons for supposing the dog to be mad.



[1st July, 1912.]

## RABIES.

SEVERAL cases have recently occurred where dogs having bitten a person or persons, were immediately destroyed and report made that they were possibly infected with rabies. In such cases it is impossible for the Veterinary Department to say in less than 18 to 20 days whether the animals were infected or not, and then only when the head of the dog concerned is received at the laboratory in a good state of preservation. Thus valuable time is lost in the treatment of persons bitten, which may lead to fatal results.

In all cases the suspected animal should, if possible, be secured by a strong collar and chain and the circumstances reported by telegram to "Veteran," Salisbury, when full instructions will be given as to the treatment and observation of the suspected animal.

## SUMMARY OF THE "GAME LAW CONSOLIDATION ORDINANCE, 1906," AND REGULATIONS ISSUED THEREUNDER.

The Ordinance divides the game into three distinct classes, described as follows :—

- (a) Birds and Small Buck.
- (b) Bushbuck, Hartebeest, Impala, Lechwe, Pookoo, Roan and Sable Antelope, Sitatunga, Tsessebe, Waterbuck, and Wildebeest.
- (c) Royal Game, which includes Eland, Elephant, Giraffe, Gemsbok, Hippopotamus, Inyala, Koodoo, Ostrich, Rhinoceros, Springbuck and Zebra.

The shooting season for Class "A" is as follows :—

In Mashonaland :

Birds from 1st May to 30th September.

Small Buck from 1st May to 31st October.

In Matabeleland :

Birds and Small Buck from 1st May to 31st October.

To shoot in Class "A" a licence costing £1 per annum is required. This entitles holders to hunt in both Provinces during the open season.

Class "B."—The season opens on 1st July and closes on 30th November in both Provinces. The licence fee is £25 for non-residents and £5 for persons having their domicile in Southern Rhodesia. This licence entitles the holder to shoot up to 15 head, which number may be increased to a total of 25 upon payment of a further sum of £15 in the one case and £5 in the other.

Class "C."—The Administrator may, if he is satisfied that the animals are actually required for scientific purposes, grant to the holder of a game licence permission to shoot or capture any of the species included in this Class. Such permit requires a £5 stamp. Applications in writing, together with proof of *bona-fides*, should be addressed to the Director of Agriculture.

Game for Farming Purposes.—Permits may be granted for the capture of Eland, Ostrich, Zebra or other animals for the purposes of breeding or farming. Such permits require a stamp of the value of £1 and remain in force for six months. Application, accompanied by a sworn declaration, should be made through the Director of Agriculture or the Civil Commissioner of the district.

Game Injuring Crops.—The occupier of any cultivated land or any person acting under the authority of such occupier, may at any time destroy game actually doing damage on such land.

Elephants on Occupied Farms, Masetter.—The destruction of Elephants when found on occupied farms on the High Veld in Masetter District is authorised (*vide* Government Notice No. 284 of 1908).



**Tsetse Fly Areas.**—Government Notices Nos. 201, 207 and 321 of 1913 suspend the close season for all classes of game, with the exception of ostriches and other birds classified as game, within the following areas in the Hartley district and the Sebungwe district for a period of one year from 1st July, 1913, and Lomagundi district for one year from 1st November, 1913 :—

**Hartley District.**—From the railway bridge on the Umfuli River, thence north-westwards along the Umfuli River to where it joins the Umniati River, thence southwards along the Umniati River to where it joins the Umsweswe River, thence eastwards along the Umsweswe River up to the drift at the Lydia Mine, thence along the old road from Lydia Mine to Etna Mine and to Inez Mine, thence northwards along the road from Inez Mine to Hartley, thence in the direction of the railway bridge to the starting point on the Umfuli River.

**Sebungwe District.**—From the confluence of the Sengwe and Lutope Rivers up the Lutope to its headwaters, thence in a south-east and easterly direction following the southern edge of the escarpment, leaving Meare's farm to the south, to the Mafungabusi Peak, thence northwards along the escarpment to the Njelele River, and down that river to its confluence with the Sanyati River, thence northwards down the Sanyati River to its confluence with the Piriwiri River, thence direct in a north-westerly direction to Picaninyemba, and thence along the footpath to Nenyunka on the Sengwe River, thence southerly up the Sengwe River to its confluence with the Lutope.

**Lomagundi District.**—An area bounded by a line drawn from the junction of the Angwa and Mkwichi Rivers, in a southerly direction up the Angwa to its junction with the Chumsenga River; thence easterly direct to the junction of the Hunyani and Msitkwe Rivers; thence northerly down the Hunyani to a point opposite Mokore Hill; thence westerly to the junction of the Angwa and Mkwichi Rivers.

Game may be shot in these areas without a licence.

Game in Class "A" may be hunted in the close season until further notice on private land in the Melssetter district by holders of a licence.

**Protected Areas.**—No game may be hunted or killed within the limits of the Commonage or Townlands of Bulawayo and within a radius of two miles of the Court House, Gwelo, or within the Urungwe Game Sanctuary, as defined by Government Notice No. 237 of 1906.

"Locust Birds" are strictly protected, *vide* Government Notice No. 121 of 1907.

**Export of Game.**—No living Game or the Eggs of any Game Birds may be exported beyond the limits of Southern Rhodesia without a written permit.

**Shooting on Private Land.**—A licence does not entitle the holder thereof to shoot on private land without the permission of the land-owner.

No. 228 of 1913.]

[24th July, 1913.

#### ELEPHANTS, HARTLEY DISTRICT.

UNDER and by virtue of the powers vested in me by section 4 (2) of the "Game Law Consolidation Ordinance, 1906," I do hereby suspend the operations of sections 9, 10 and 12 of the said Ordinance in so far as they relate to elephants on or within five miles from the farm Dawn, in the Hartley district, for a period of six months from date hereof.

No. 390 of 1912.]

[19th December, 1912.]

## PROTECTION OF LOCUST BIRDS.

UNDER and by virtue of the powers vested in me by the "Game Law Consolidation Ordinance, 1906," I do hereby declare that the following Locust Birds :—

- (1) Great Locust Bird or White Stork (*Ciconia alba*);
- (2) Lesser Locust Bird or Nordmann's Pratincole (*Glareola melanoptera*);
- (3) Small White Heron or Cattle Egret (*Bubulcus ibis*);
- (4) Wattled Starling (*Dilophus carunculatus*);

are added to class "A" of the said Ordinance, and shall be strictly protected, and not hunted or destroyed, throughout Southern Rhodesia for a period of five years from date hereof.

No. 240 of 1910.]

[1st September, 1910.]

## INSECT PESTS.

UNDER and by virtue of the powers vested in me by the "Nurseries Ordinance, 1909," I hereby proclaim the undermentioned insects to be pests within the meaning of the said Ordinance :—

- The Red Scale (*Chrysomphalus aurantii*).
- The Oleander Scale (*C. hederæ*).
- The Circular Purple Scale (*C. aonidum*).
- Ross's Black Scale (*C. rossi*).
- The Purple or Mussel Scale (*Lepidosaphes beckii*).
- The Long Scale (*L. gloverii*).
- The White Peach Scale (*Aulacaspis pentagona*).
- Woolly Aphis or American Blight (*Schizoneura lanigera*).

No. 259 of 1913.]

[21st August, 1913.]

## IMPORTATION OF PLANTS REGULATIONS.

UNDER and by virtue of the powers in me vested by the "Importation of Plants Regulation Ordinance, 1904," I do hereby declare that the following regulations shall, from date hereof, be in force and effect, and that the regulations published under Government Notices No. 141 of 1906, No. 133 of 1908, No. 228 of 1912, and No. 319 of 1912, are hereby cancelled.

1. In these regulations the following terms shall have the meanings respectively assigned to them if not inconsistent with the context and subject matter :—

- "British South Africa" shall mean the British Possessions and Protectorates in that portion of Africa lying south of the Zambesi River.
- "Chief Inspector" shall mean any person appointed by the Administrator for the purpose of carrying out in chief the provisions of these regulations.
- "Inspector" shall mean any person appointed by the Administrator for the purpose of carrying out the provisions of these regulations.
- "Plant" shall mean any tree, shrub or vegetable, and the fruit, leaves, cuttings, bark or any part thereof whatsoever, whether severed or attached.
- "Nursery stock" shall mean trees or plants of any kind, not being vegetables, grown or cultivated for the purpose of trade, and with the intention of their being sold, or distributed for the purposes of their being grown elsewhere than on the premises where they stand.



- "Insect pest" shall mean any insect or other invertebrate animal which may be injurious to agricultural or horticultural products.
- "Plant disease" shall mean any fungus, bacterial or other disease which may be injurious to agricultural or horticultural products.
- "Nursery" shall mean any land or premises whereon is grown or cultivated any nursery stock, and includes any piece of ground adjoining such land or premises, and held by the same owner or occupier, on which are grown fruit trees, plants or shrubs not intended for sale.
- "Nurseryman" shall mean the owner, occupier or other party responsible for the management of the nursery.

2. These regulations shall apply generally to any plant imported into Southern Rhodesia.

3. (1) Any plant, or any package, case, pot or other covering of the same, whether introduced by rail or by post, may, before being delivered to the consignee or addressee, be detained and examined by an Inspector for the purpose of determining as far as possible whether or not any insect pest or plant disease is present, and it shall be the duty of the consignee or his agent to open the coverings and to afford every facility to the Inspector during his examination.

(2) Such plants, together with all other articles in the same receptacle and including all packing material, may, when deemed necessary by an Inspector, as a precautionary measure against the introduction of any insect pest or plant disease, be treated by and to the satisfaction of the Inspector at the expense of the consignee or addressee, in default of which the consignment or package may be refused entry into Southern Rhodesia or destroyed by the Inspector.

(3) If any plant be found actually infested in whole or in part with any insect pest or plant disease it shall, together with all other articles in the same receptacle, and including all packing material, be cleansed by and to the satisfaction of the Inspector, or if any treatment at command be deemed by him ineffectual for the absolute eradication of the insect pest or plant disease, or if the Chief Inspector considers the insect pest or plant disease to be of a specially dangerous character, the consignment or package may, upon his instructions, be destroyed without delay, no compensation being paid.

(4) An examination fee of 1s. per each class of plant included in a consignment will be charged, and, in the case of plants calling for treatment, a fee of 5s. for each use of the fumigating chamber.

4. The inspection and treatment of any consignment imposed by these regulations shall take place on premises provided by the Government for the purpose, but special arrangements may be made with the Chief Inspector for the execution of all the provisions of Regulation 3 on the premises of the consignee or other place when approved facilities are provided.

5. On an Inspector being satisfied with respect to a consignment that all the regulations herein set forth have been duly complied with, he shall issue a certificate to that effect to the consignee or addressee, but before the issue of such certificate the consignment shall be under the Inspector's control for the purposes of these regulations.

6. The consignee shall, when called upon to do so by an Inspector, furnish a certificate with respect to any consignment, shewing the name and address of the consignor or shipper and the number and kind of packages, and any and all particulars of name, quantity, variety, grade marks and place of origin of the articles.

7. The Government does not hold itself responsible for any loss or damage that may result from the destruction of articles under these regulations, or from any process or detention that may be considered necessary or desirable to cleanse or disinfect the articles or to discover the existence or otherwise of any insect pest or plant disease.



## PART I.

*Regulations affecting Plants from outside British South Africa.*

8. No person shall introduce or cause to be introduced into Southern Rhodesia any plant from places outside British South Africa except by post or through the port of Umtali or the ports proclaimed under section 8 of the "Agricultural Pests Act, 1911" (Union of South Africa), as ports of entry into the South African Union, or such ports of entry as the Administrator may allow by special permit.

9. No person shall introduce into Southern Rhodesia from any place outside British South Africa—

- (1) any eucalyptus, acacia or coniferous plant or any portion thereof with the exception of seeds;
- (2) any stone fruit tree or any living portion thereof which was grown or produced in any part of North America in which either of the diseases known as peach yellows or peach rosette exists;
- (3) any live peach stones;
- (4) any stone fruits in their fresh state, including apricots, plums, peaches, nectarines and cherries;
- (5) any stocks (that is, young rooted plants intended for budding and grafting purposes) whatever, except those of the following, which may be imported in bulk only—that is to say, in quantities of not less than 1,000 :—

Almond,

Pear,

Plum,

Persimmon;

Cherry,

Northern Spy and other apple stocks which are accepted by the Chief Inspector as being resistant to the attack of woolly aphis (*Schizoneura lanigera*).

10. The introduction into Southern Rhodesia from places outside British South Africa of the under-mentioned plants or any portion thereof for propagation, with the exception of seeds and fruit, shall be limited to importations made under the direct supervision of the Government and subject to such precautionary measures as may be deemed necessary, namely :—

- (1) Grape vines or other plants of the family *Vitaceæ*,
- (2) Sugar cane,
- (3) Plants cultivated for the production of rubber,
- (4) Tea plants,
- (5) Coffee plants,

but this limitation shall not apply to the seeds or fruit of the above, except those of coffee.

11. No person shall introduce into Southern Rhodesia from any place outside British South Africa—

- (1) any flowering or ornamental plant,
- (2) any cotton seed,

except by special permission of the Director of Agriculture, who may grant or withhold such permission at his discretion.

12. (1) Subject to the foregoing, any other tree or fruit-bearing plant or scion or other part thereof for propagation may be introduced only after a special permit has been obtained from the Director of Agriculture. Such a permit shall only be issued at the discretion of the Director of Agriculture, and it shall limit the introduction to not more than ten trees or 100 cuttings of any one variety, and shall not be issued for more than an aggregate of 100 trees or 1,000 cuttings to any one person during any one year.

(2) For the purpose of this clause the term "tree" shall include any plant of the nature of a tree. In case of dispute as to whether any plant falls under this restriction, the decision of the Director of Agriculture shall be final.

## PART II.

*Regulations affecting Plants from British South Africa.*

13. No person shall introduce into Southern Rhodesia from any other part of British South Africa—

- (1) any cutting of any grape vine or any grape vine, unless the same is resistant or grown upon roots resistant to the attack of the grape phylloxera (*Phylloxera vastatrix*);
- (2) any apple stock or tree, unless grown upon Northern Spy roots or other roots which are accepted by the Chief Inspector as being resistant to the attacks of the woolly aphis (*Schizoneura lanigera*);
- (3) any tree or plant that was propagated beyond British South Africa, unless the introduction of the same would have been permitted under section 9 of these regulations.

14. No person shall introduce into Southern Rhodesia from other parts of British South Africa any nursery stock except under the following conditions :—

- (1) That the nurseryman from whom the stock is obtained holds a permit from the Director of Agriculture for the introduction of such nursery stock into Southern Rhodesia. Such permit shall be granted if the Director of Agriculture is satisfied from the report of the Government Entomologist of the colony or territory in which such nurseryman's premises are situated that no restriction on the removal of the stock would be imposed were the premises situated in Southern Rhodesia. Any such permit may be cancelled by the Director of Agriculture, and it shall expire twelve months from the date of the inspection on which it was based.
- (2) That any fruit tree, fruit-bearing plant and any portion thereof, other than fruit and seed, has been fumigated prior to shipment with hydrocyanic acid gas in a chamber.
- (3) That every consignment is accompanied by a certificate in the form detailed under Schedule "A" of these regulations, which specifies the numbers and kinds of plants contained in the consignment, and shews that the provisions of sections 15 and 16 of these regulations have been observed.

15. The introduction into Southern Rhodesia of any plant, not being seed, fruit, bulb, tuber, cut flower, vegetable or vegetable transplant originating in British South Africa, with the exception of nursery stock grown in a nursery registered at the Department of Agriculture, Pretoria, under the "Agricultural Pests Act, 1911" (Union of South Africa), and the introduction of any coffee seeds for the purpose of propagation, is prohibited, except under special permission from the Director of Agriculture, who may impose such conditions in regard to such importations as he may think fit.

16. No person shall introduce into Southern Rhodesia any grape vine, Virginia creeper or other plant of the family *Vitaceæ*, or any fruit or any portion thereof, with the exception of seed, from—

- (1) any of the following districts of the Cape Province :—

|              |                  |                |
|--------------|------------------|----------------|
| Aberdeen     | Albany           | Alexandria     |
| Bathurst     | Bedford          | Cradock        |
| Cathcart     | East London      | Fort Beaufort  |
| Graaf Reinet | Glen Grey        | Humansdorp     |
| Jansenville  | Kingwilliamstown | Port Elizabeth |
| Komgha       | Middelburg       | Somerset East  |
| Peddie       | Queenstown       | Tarka          |
| Stockenström | Stutterheim      | Uitenhage      |
|              | Victoria East    | St. Marks      |

- (2) the district of Barberton, in the Transvaal;

- (3) the county of Pietermaritzburg, in Natal.

This regulation shall not apply to grape jam, wine, brandy, vinegar or must.



## PART III.

*Potato Regulations.*

17. (1) No person shall introduce or cause to be introduced into Southern Rhodesia from outside British South Africa any potato tubers, unless he produces and delivers up to an Inspector—

- (a) a statement on oath from the consignor stating fully in what country and what particular place or places in that country the potatoes were grown, and containing particulars clearly establishing the identity of the consignment; and
- (b) a certificate from the Department of Agriculture of the declared country, or a certificate from some official institution of that country which the Director of Agriculture, Southern Rhodesia, has agreed to recognise in lieu of such Department, certifying at a date not more than thirty days before the time of the despatch of the consignment that the disease known as black scab or warty disease (*Synchytrium endobioticum*, Percival) has not been known to exist, so far as it is aware, within five miles of the place or places in which the potatoes are declared to have been grown.

Provided that the certificate made necessary by (b) shall not be required in respect of any consignment from a country—

- (i.) if the Government thereof has certified to the Administration of Southern Rhodesia that the said disease has not been known to exist in that country, and if that Government has undertaken to inform the Administration of Southern Rhodesia of any outbreak and if information recording an outbreak has not been received; or
- (ii.) if the consignee produces from the Department of Agriculture or other aforesaid recognised institution of the declared country of origin a certificate dated within nine months of the day of arrival of the potatoes concerned to the effect that the specified disease has not been known to exist, as far as it is aware, in the shire, county, department or other such territorial division comprising the place or places in which the potatoes are declared to have been grown, but, if required by an Inspector, the consignee shall deliver up an attested copy of the certificate herein provided for.

(2) Notwithstanding any provisions of the previous sub-sections, neither the certificate declaring the origin of the potato tubers nor that referring to warty disease or black scab shall be required in respect of potatoes imported from outside British South Africa into the South African Union and partly or wholly re-consigned to Southern Rhodesia.

18. Any consignment of potatoes imported from other parts of South Africa or from overseas, if found on inspection to be infested with the pest known as root gallworm or root knot eelworm (*Heterodera radicumicola*) or with any other species of eelworm injurious to plants, will be refused admittance into Southern Rhodesia or destroyed.

19. Should any consignment on arrival be found to be infested with warty disease or black scab, it will be totally destroyed.

20. Any person guilty of a contravention of these regulations shall be liable to a fine not exceeding £10. or, in default of payment, to imprisonment with or without hard labour for a period not exceeding one month.

## SCHEDULE "A."

Certificate required with every consignment of nursery stock exported from the South African Union into Southern Rhodesia :—

I hereby certify that the plants herewith consigned, to wit, .....  
 bales ..... crates ..... tins, for the party of whom the address  
 is given on the reverse side of this certificate, are produced from a nursery  
 duly registered under the "Agricultural Pests Act, 1911," and that the



provisions of the regulations published thereunder, *inclusive of fumigation*, have been faithfully observed with respect to the same, and that I hold an official permit for the introduction of these plants into Southern Rhodesia.

Date.....

.....  
Registered Nurseryman.

SCHEDULE "B."

*Consignor's Declaration.*

Address.....

I, the undersigned, ....., member of the firm of ....., consignor of ..... cases, each containing ..... net weight of potatoes, for ..... purposes and marked ....., to be shipped per steamer ..... from ..... to ....., do hereby declare that the potatoes herein referred to were all grown at ....., in the district of ....., in .....

Signed .....

Declared at ....., this ..... day of ....., 191..., before me,

.....  
Name and title of officer administering oath.

SCHEDULE "C."

*Official Certificate re Black Scab.*

The undersigned, under authority of the Department of Agriculture of ....., hereby certifies that the potato disease known as black scab and warty disease, and ascribed to the fungus *Synchytrium endobioticum*, Percival, has not, as far as is known to the Department of Agriculture, been known to exist within five miles of ..... in the district of .....

Signature .....

Title .....

Address .....

Date and official stamp or seal  
.....

No. 317 of 1913.]

[30th October, 1913.]

IMPORTATION OF PLANTS REGULATIONS.

IT is hereby notified for public information that, in terms of section 1 of the Importation of Plants Regulations, published under Government Notice No. 259 of 1913, I appoint the following to be Inspectors for the purpose of carrying out the aforesaid regulations:—

Frederick Fisher, Esquire, Collector of Customs, Salisbury;  
 Edred Augustine Crake, Esquire, Collector of Customs, Umtali;  
 James Robert Bruce Baxter, Esquire, Chief Customs Examining Officer,  
 Bulawayo;  
 Thomas James Wadeson, Esquire, Officer in Charge of Customs,  
 Gwelo;

or any other person hereafter appointed to or acting in any of the above-mentioned capacities.

No. 249 of 1908.]

[27th August, 1908.]

### PROTECTION OF TREES.

IT is hereby notified for public information that any person who shall cut down for use as fuel, or for any other purposes than *bona-fide* farming, mining or manufacturing purposes, or cause to be so cut down the "Wild Westeria" (native name M'Pakwa or M'poea) tree, will be liable to prosecution for contravention of the provisions of the Forest and Herbage Preservation Act, 1859, and upon conviction to a fine not exceeding £100, or to imprisonment with or without hard labour for a term not exceeding six months, or to such fine and imprisonment, or to such imprisonment without a fine.

No. 211 of 1909.]

[16th September, 1909.]

### PRODUCE FROM NATAL AND TRANSVAAL.

UNDER and by virtue of the power vested in me by section 8 (2) of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction from Natal and the Transvaal of the undermentioned produce thereof:—Grass, straw, hay, lucerne hay, forage, green lucerne, sugar cane, or any other bedding or fodder plant.

### FULL TEXT OF "HERBAGE PRESERVATION ORDINANCE, 1913."

AN ORDINANCE to prevent the destruction of Herbage, Trees and Shrubs by Fire.

BE IT ENACTED by the Administrator of Southern Rhodesia, with the advice and consent of the Legislative Council thereof, as follows:—

So much of the "Forest and Herbage Preservation Act, 1859," of the Colony of the Cape of Good Hope, and of any amendment thereof, as may be inconsistent with the provisions of this Ordinance, is hereby repealed.

Any person who shall, without lawful authority so to do, wilfully or by gross negligence set fire to or kindle any fire which by spreading shall set fire to any tree, shrub, bush, brushwood, undergrowth or grass not his property, shall be guilty of the offence of contravening this section, and shall upon conviction be liable to a fine not exceeding £100, or, in default of payment of any fine imposed, to imprisonment with or without hard labour for a period not exceeding one year, or to corporal punishment in any number of lashes or cuts with a cane or rod not exceeding fifteen, or to the above imprisonment without the option of a fine, or to any two of the above-mentioned punishments.

All Magistrates and Assistant Magistrates, and all Native Commissioners and Assistant Native Commissioners, in respect of persons over whom they have jurisdiction by law, shall have jurisdiction to impose summarily the punishment above set out.

The Court before which any conviction for a contravention of section two of this Ordinance takes place may, during or immediately after the trial, take and hear evidence as to the amount of damage caused by any contravention of the section, and may assess such damage to an amount within the civil jurisdiction of such Court and give judgment against the offender for the amount of the damage so assessed; provided always that such proceedings shall not be taken unless the offender has had reasonable notice that the amount of damage caused will be enquired into.

Nothing in this Ordinance shall be taken to affect the right of any person aggrieved to recover damages by civil action for any loss sustained by himself, unless he shall have availed himself of the provisions of section four hereof.

In such areas as the Administrator, on the petition of an actual majority of owners or occupiers representing not less than two-thirds of the land in such areas, may prescribe, any owner or occupier of land who desires to guard against fires crossing the boundaries thereof, may call upon the occupier of any adjoining land to contribute one-half of the labour or cost necessary to provide sufficient fire-guards on the common boundary. If any person so called upon shall refuse or neglect to contribute as aforesaid, the person so calling on him may proceed with the construction of a fire-guard and recover half the necessary cost of such construction from such first-mentioned person. The width of a fire-guard shall be such as the Administrator may prescribe at the instance of the petitioners, but in no case shall it be less than fifteen feet on each side of the common boundary. For the purposes of this section the term "owner or occupier" shall mean, in respect of native reserves, the British South Africa Company.

Any person who is lawfully upon the land of another or upon any road, outspan or vacant land, shall carefully and properly extinguish any fire kindled or used by him, and until he has so done shall not proceed such a distance from any such fire as to be unable to control it by himself or his servants.

No person shall pursue any kind of animal, or knowingly enter upon the land of another with the intention of pursuing any kind of animal, without the consent of the owner or occupier of such land.

No person shall take or remove honey or bees from the land of another without the consent of the owner or occupier of the land upon which the honey or bees may be.

Any person trespassing upon any land enclosed by a sufficient fence, or being found upon such land away from a recognised road or path, shall be liable to the penalties hereinafter set out.

Every prospector proceeding to prospect for minerals, under and by virtue of any prospecting licence, upon occupied land, shall give notice to the occupier of his intention to prospect.

Every person, before proceeding to burn growing or standing herbage, grass or bush upon his own land, shall give reasonable notice to adjoining occupiers of his intention so to do. Such notice shall state as nearly as may be done the time at which such burning will take place.

Nothing in this Ordinance shall be taken to prevent a person, when his life, person, or property are in danger from an approaching fire, from setting alight to and burning grass, herbage, or bush, in the manner commonly known as counter-firing, in order to prevent such injury or loss; provided that reasonable care is taken that a fire kindled does not spread beyond the limits necessary to secure safety from injury and loss.



If any servant when acting under the direction or command of his employer by omission or by act of commission shall contravene any of the provisions of this Ordinance, then such employer and the servant may both or either of them be prosecuted, and if convicted punished under this Ordinance.

The penalties for any act or omission in contravention of the provisions of this Ordinance shall be, unless otherwise specifically provided—

- (1) for the contravention of sections eleven and twelve a fine of £5, or in default of payment of any fine imposed, imprisonment with or without hard labour for a period not exceeding one month;
- (2) for the contravention of sections seven, eight, nine and ten a fine of £10, or in default of payment of any fine imposed, imprisonment with or without hard labour for a period not exceeding three months;

provided that should any act or omission complained of also result in a contravention of section two, prosecution may follow under that section.

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No. 314 of 1913.]

[23rd October, 1913.]

#### ESTABLISHMENT OF POUND ON FARM GARTH.

UNDER and by virtue of the powers vested in me by section 5 of "The Pounds and Trespasses Ordinance, 1903," I do hereby declare and make known that at the request of the Civil Commissioner, Bulawayo, a pound has been established on the farm Garth, in the Bulalima-Mangwe district, and that the said pound shall be available for the public from 1st November, 1913.

## Department of Posts and Telegraphs, Southern Rhodesia.

Postal Notice No. 12 of 1913.

### AGRICULTURAL PARCELS POST.

IT is hereby notified for public information that, on and after the 1st August, 1909, any article produced, and, if manufactured, produced and manufactured within Southern Rhodesia may be transmitted by Agricultural Parcels Post at the reduced rate of threepence per lb. or fraction thereof, up to a limit of eleven lbs. in weight.

The Agricultural Parcels Post is designed to bring the producer into direct communication with the consumer, and is available for the transmission of :—

|                        |             |              |
|------------------------|-------------|--------------|
| Biscuits               | Dried Meats | Plants       |
| Bread                  | Eggs        | Poultry      |
| Butter                 | Flour       | Seeds        |
| Confectionery          | Flowers     | Sugar        |
| Cigarettes             | Honey       | Tobacco      |
| Dried & Bottled Fruits | Jam         | Wool Samples |

and other articles produced within Southern Rhodesia. It does not extend beyond the borders of Southern Rhodesia.

The senders of articles at the reduced tariff applicable to the Agricultural Parcels Post will be required to sign a declaration that the contents are the *bona fide* produce of Southern Rhodesia.

The limits of size and weight, and the general regulations, are those applicable to the Inland Parcels Post.

G. H. EYRE,  
Postmaster General.

General Post Office, Salisbury,  
31st March, 1913.

### REDUCTIONS IN RATES.

THE Beira and Mashonaland and Rhodesia Railways announce that reductions in rates as previously advertised, to operate from a date to be agreed upon with the Chambers of Commerce in Rhodesia, will be brought into effect from the dates specified hereunder :—

September 1.—Cement and Timber.

October 1.—Petrol in solid iron or steel drums. Class rates Salisbury—Gwelo and Blinkwater Branch.

Live Stock and Vehicles, Beira—Salisbury Line.

Public Telegrams, Beira—Macequece Line.

December 1.—Galvanised Iron, Angle Iron, Bar Iron, etc., articles of a heavy and undamageable nature used in connection with mining.

January 1, 1914.—Fencing Material.

A Rates Supplement to Tariff Book containing full particulars of the alterations may be obtained at all stations.

ADVERTISEMENTS.

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**British South Africa Company.**

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**GOVERNMENT FARM, GWEBI**

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**AT STUD**

**FRIESLAND BULL.**

***Dutchland Colantha Sir Cornucopia.***

No. 92,533 A.H.F.H.B.

This bull was recently purchased from Mr. A. J. Maclaurin, by whom he was imported from the United States of America. He comes of a family of very noted milking powers. The record average production over seven days of his dam and grand-dam was 30-40 lbs. of butter.

**Fee £2 2s.**

**SHORTHORN BULL.**

***Favourite Pride.***

A pedigree red shorthorn bull, bred by Mr. James Durno, Rothiebrisanne, Fyvie, Scotland, and imported in 1911, and entered in the Coates Shorthorn and South African Stud Books.

**Fee £2 2s.**

**LARGE BLACK BOAR.**

***Honingberg Bridgman II.***

No. 195, S.A. Stud Book, vol. vi.

Bred by Mr. S. C. Skaife, Bloemfontein.

**Fee 5s.**

**ALL FEES ARE STRICTLY PAYABLE IN ADVANCE.**

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**FOR SALE**

**MERINO RAMS.**

A limited number of pure merino rams are from time to time available at  
**£4 each.**

**PAYMENTS MUST BE MADE WITH ORDER.**

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Full particulars regarding above may be obtained on application to the  
DIRECTOR OF AGRICULTURE, Salisbury.





# THE RHODESIA Agricultural Journal.

*Edited by the Director of Agriculture,  
assisted by the Staff of the Agricultural Department.*

PUBLISHED BI-MONTHLY.

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## Editorial.

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*Correspondence on subjects affecting the farming industry of Southern Rhodesia is invited. Enquiries will be replied to direct, or through the medium of the JOURNAL. An interchange of ideas and suggestions between farmers will be particularly welcomed. Contributions of a suitable nature for insertion in this JOURNAL will be much appreciated. All communications regarding these matters, and advertisements, should be addressed to the Editor, Department of Agriculture, Salisbury.*

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THE WATER ORDINANCE.—Farmers concerned in irrigation will be pleased to learn that the Water Ordinance was promulgated on 26th December, 1913, and is now law. All interested would be well advised to obtain a copy of the Ordinance, and to make themselves acquainted with its provisions. A brief outline of the principles of the Ordinance will be found on page 699, No. 5, Vol. X., of the *Agricultural Journal*, but it may be just as well to repeat here some of the salient features. The underlying principle of the Ordinance is that of State control, which is clearly enunciated in clause 5 of Chapter I. This reads:—"All water, other than private water, is vested

in the Administrator, who shall authorise its use, diversion and apportionment, subject to the terms of this Ordinance and in conformity with any regulations framed thereunder." By State control, it is hoped to apportion the use of the public waters of this country so as to be of the greatest benefit to both the individual and the community at large.

Any farmer or body of farmers desiring to use public water must apply to the Administrator to have his or their right to such water defined. Should the Administrator consider it necessary, or should he be petitioned so to do, before granting this right, he shall instruct a Water Court, constituted under the Ordinance, to consider the matter, if advisable, on the spot. The claims of any objecting owners will be duly considered, and the right of use to the water only apportioned after a report has been received from the Water Court. By this means it is hoped that the fairest possible division may be arrived at, and possible future litigation reduced to a minimum.

Another important provision deals with servitudes. The rights granted under this Chapter are subject to compensation, but they are very important and of great value to the irrigator. These rights consist of "servitude of storage," "servitude of abutment," and "servitude of passage." In order that these servitudes may be exercised, clause 44 of Chapter IV. gives any person who has a right to the use of water of a public stream at any point in its course the right to divert it at any point in its course most suitable to him. Private water, of course, belongs to the proprietor of the land on which it is found, and of which he has the sole and exclusive use.

Should riparian owners be unable to use the whole of the waters of a public stream, it may be allowed to be taken on to non-riparian land, or after non-riparian land in that water-way has been satisfied, into another catchment area.

In case of dispute arising out of apportionment of water, etc., under the provisions of the Ordinance, it is necessary for the disputants to first bring their case to the Water Court, although with right of appeal to a higher tribunal. The intention of this is to cheapen the cost of litigation, and to prevent a wealthy owner or company from at once dragging

a poorer neighbour to the higher courts. In addition to their judiciary function, Water Courts may, if required to do so by the Administrator, investigate, define, record, and apportion the rights to water; determine and fix the site of diversion or storage; report on the use or waste of water, and the removal of or interference with any irrigation work.

Clause 61, Chapter V., will prove of particular interest to those who have already carried out irrigation works. It states:—“(1) Nothing in this Ordinance shall interfere with or derogate from rights already acquired, in so far as actual use has been made of such rights. All such rights, and such other rights to the use of water as may be acquired under this Ordinance, shall lapse and be void if not used for a consecutive period of three years, if such failure to use is owing to the neglect or default of the person possessing such rights. (2) Should the holder of any such right desire to have such right determined and recorded, he shall submit the matter to a Water Court for its decision.”

Intending irrigators should make early application to the Secretary to the Administrator to have their rights to the use of water of public streams properly defined, and those farmers who are already using such water and have acquired the right to do so, would also be in a better position if they made a similar application, as they are entitled to do under clause 61, sub-section 2, of the Ordinance.

Those desirous of storing storm or surplus water should carefully read the provisions of clause 16 of the Ordinance, which should ensure them a considerably greater measure of security than is at present given under common Roman-Dutch law.

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THIRD INTERNATIONAL CONGRESS OF TROPICAL AGRICULTURE.—We have been requested to draw attention to this quinquennial Congress of Agriculturists, which will be held in England this year for the first time. The Congress will be attended by agriculturists from all tropical portions of the globe, and any Rhodesian farmers who may be in the Old Country at the time the Congress meets are strongly recommended to attend. The Congress will be held at the Imperial



Institute, South Kensington, London, S.W. It will open on Tuesday, 23rd June, and close on Tuesday, 30th June, 1914. The following subjects are suggested for papers and discussion at the morning meetings. Contributions on these and similar subjects are invited:—I. Technical Education and Research in Tropical Agriculture; II. Labour Organisation and Supply in Tropical Countries; III. Scientific Problems of Rubber Production; IV. Methods of developing Cotton Cultivation in New Countries; V. Problems of Fibre Production; VI. Agricultural Credit Banks; VII. Agriculture in Arid Regions; VIII. Problems in Tropical Hygiene and Preventive Medicine.

Papers for the afternoon meetings are invited on the following subjects:—I. Problems relating to Tropical Agriculture and Forestry; II. The Cultivation and Production of Rubber, Cotton and Fibres, Cereals and other Foodstuffs, Tobacco, Tea, Coconuts, other Agricultural Products, Forest Products; III. Plant Diseases and Pests affecting Tropical Agriculture.

Papers recommended for publication and reports of discussions will be published at the close of the Congress. The subscription for membership of the Congress will be £1, entitling members to admission to all meetings and receptions and to receive the volume of printed papers and discussions, on publication. Those desiring to become members of the Congress are requested to communicate with the Organising Secretaries for the Congress, as soon as conveniently possible, in order that their names and permanent addresses may be registered. A general programme, with the complete arrangements, will be forwarded to all registered members before the meeting. Arrangements will be made for the accommodation of members of the Congress at suitable hotels.

Arrangements have been made by the Organisers of the International Rubber Exhibition and of the International Cotton, Fibres, and Allied Industries Exhibition to hold these Exhibitions during the period of the Congress, at the Royal Agricultural Hall, Islington, London, N. Members of the Congress will receive free season tickets of admission to the Exhibitions; and special means of conveyance between the Imperial Institute and the Agricultural Hall will be provided.

The Organising Committee cordially invite all who take an interest in tropical Agriculture and Forestry to attend the Congress. All correspondence relating to the communication of papers and the arrangements for the Congress should be addressed to:—The Organising Secretaries, Third International Congress of Tropical Agriculture, Imperial Institute, London, S.W.

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**BACON FACTORY.**—The announcement of the decision to establish a bacon factory immediately at Salisbury will meet with general approval. It comes well at a moment when it is being realised that the period of high prices for maize, which continued longer than might have been looked for, has probably come to an end. The acreage under maize is well known to have increased enormously, although unfortunately figures recording this expansion are unprocurable. The present season, although late, is not so unpropitious as to lead us to anticipate a serious shortfall in our crops, and we may reasonably expect a considerable surplus of maize for export after next harvest. Until local demand, plus conversion into other products, can utilise all the maize grown, the surplus must be shipped, but every effort must be made to use our staple crop on the spot. Maize constitutes the chief item in the ration of pigs, and bacon imported from England, Denmark, America and Australia forms a large constituent of our human dietary. The two-fold advantage of converting our maize into bacon is, therefore, apparent.

Whilst the first object of our bacon factory, like the butter factory, must be no doubt to meet the local demand, we may reasonably look ahead to the possibilities of a future export trade, especially in view of the limitations of the present world's supply and the growing consumption within their own borders of foodstuffs in countries which at one time supplied the markets of Europe.

An actual commencement has been made, and a factory capable of dealing with fifty pigs a week, and so arranged as to be readily extended if necessary, will shortly be in operation on a site provided by the Town Council of Salisbury. It is now for the farmers of Rhodesia to seize this opportunity,



and to furnish a regular and adequate supply of pigs under one year old of from 150 to 200 pounds live-weight, sound, in proper condition, and of the proper quality for the purpose in view. A very comprehensive article dealing with the production of the bacon pig, written by Mr. R. C. Simmons, appears in this issue. There is but little doubt that excellent bacon can be made if the proper pig is supplied. For such an animal, which must be free from measles and otherwise fit for human consumption, a fixed reasonable price, delivered at the factory, will be paid, according to quality, whilst the British South Africa Company, which is furnishing the funds needed to initiate this enterprise, has declared its intention of dividing profits, after expenses and a low interest have been met, equally with producers in proportion to the amount of their supplies.

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ENCOURAGEMENT OF A PURE SEED SUPPLY.—Attention is directed to the article contributed by the Agriculturist and Botanist on this subject. The resolution before last year's Agricultural Union Congress was productive of a good deal of discussion. The Union Government, we understand, is at present considering legislation such as exists already in other progressive agricultural countries, and when this is brought into force, Rhodesia will benefit in respect of seeds imported from the Union. Meanwhile, an effort should be made to place our own house in order, as there is no doubt that a great deal of the seed offered for sale by local producers leaves much to be desired.

In this connection we append a letter received from one of our leading seed merchants in Rhodesia. The instances quoted are examples of what the system outlined in the article in question aims at preventing, or at least rendering less frequent. It may be pointed out that reprehensible practices of this nature not only damage the reputation of the seller and cause loss to the seed merchant, but may entail heavy financial loss to the third party purchasing the seed:—

“The matter of a pure seed supply, especially of locally grown seeds, is one that naturally interests us, and in regard to this we should like to make some remarks. For some years



we have from time to time purchased fairly large quantities of seed from local growers at remunerative prices to them. As a rule, we do not make any offer until a sample is submitted, and when an offer is made the sample in question is reserved for comparison with the bulk on delivery. We are sorry to say that in a great number of cases, seeds delivered have proved to be inferior or totally different to the original sample.

“It is to the advantage of all concerned that we should purchase, so far as possible, our requirements locally, but unless many of our farmers realise the necessity for pure seed, and that it is compulsory to supply what they have actually offered, we are afraid much money will continue to go out of this country for seeds which might easily be produced here.

“This season, the supplies in some cases have been particularly bad, resulting in much inconvenience and loss to those concerned. It is not practicable for us to examine every bag of seed from top to bottom, as you, of course, know, and unfortunately the inferior condition is occasionally discovered only when the farmer is planting, or about to do so. We should like to give you just a few instances of local supplies of seed delivered to us this season; they are fair examples, without the slightest exaggeration, of what has occurred altogether too frequently in our experience. On the other hand, the majority of farmers from whom we have purchased, deserve great credit for the way in which they have selected the seed.

“No. 1. *Seed Maize* (35 bags).—These were sold to us as having been secured from carefully selected ears, tipped, butted and hand-shelled. We did not like the look of the seed on its arrival, and, on making enquiries, found that it was prepared (as the supplier later on admitted) as follows:—Without any portion being selected, the whole crop was put through a power-sheller, and the large seed, pieces of cob, husk, etc., thus obtained were stirred in baths of water to separate the grain from the rubbish. The maize was then dried and sent in as the high grade seed described, and which we returned at the seller's cost.

“No. 2. *Eight-row Hickory King Seed Maize* (100 bags).—A splendid sample was shewn, and we offered 30s. per bag for it, which was accepted. They were delivered in due course,

and found to contain cracked grains, tips and butts, and were totally different to the sample. Indeed, they were just a shade better than the ordinary feeding mealies, and as such we took them over at the market price then ruling and had them milled.

“No. 3. *Seed Potatoes* (250 bags).—The sample shewed a fine clean tuber of uniform seed size, nicely sprouted. The delivery resulted in forty bags large table size, eight bags small, fit only for pig food, and 72 bags of a mixed size; total 120 bags, as against 250 bags offered. The whole lot had to be graded and kept for some weeks before shewing a sign of sprouting.

“No. 4. *Dhal*.—About ten bags purchased for delivery within a specified time; arrived some three weeks overdue, the total weight being 75 lbs. instead of about 2,000 lbs.

“No. 5. *Virginian Bunch Ground Nuts*.—The few bags examined on arrival were very good, but we have received several complaints since sending them out, all to the effect that the bags contained stones, other rubbish, and small nuts of a different type.

“No. 6. *Millet* (800 lbs.).—The sample was perfectly clean, but when the seed was delivered we found it contained foreign matter, and, after sieving and winnowing, the net results obtained were:—16 lbs. chaff and straw, 19 lbs. small stones, and 62 lbs. pigweed and grit in about equal proportion, leaving 702 lbs. of clean seed.”

The policy advocated by Mr. Mundy, of growing as far as possible the needful supplies of seed within the country, will, we think, be endorsed by the majority of farmers, and in his second contribution to this issue—dealing with the production of pedigree seed—simple directions will be found which, with a little care and attention, any farmer may put into practice. Maize, being the most important crop, is dealt with first, and subsequent articles will follow on the handling of other seed crops.

There is undoubtedly a very considerable demand for pure seed, and many farmers whose arable farming operations are restricted for any reason might well add to their incomes by

taking up the systematic growing of pedigree seed. Little can be done by legislative enactment to control the quality of seed, but if supported by the farming community, the suggested systematic assistance through the Department of Agriculture should do much to encourage and facilitate the dissemination of reliable seed. The question is one which vitally concerns every farmer in the country who turns a plough furrow. No matter what crop he grows, the seed used should be the best available, and it rests with the individual himself to elect whether his seed is the best or something inferior.

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AGRICULTURAL STATISTICS.—The need of reliable agricultural statistics is becoming more and more apparent as the country progresses, and the necessity for accurate information concerning the extent and growth of the farming industry is constantly being impressed upon us. It is a material disadvantage that we are unable to furnish any reliable statement as to the scope of the farming industry or to ascertain from time to time its growth and progress, as can be done in the case of the mining industry, or in regard to our railways, schools and population. Custom returns only indicate the extent of our exported surplus produce, and not the actual amount raised, whilst imports only reveal the measure of our present deficiency in production, and in no way indicate the measure of our local consumption.

At present we are without the necessary assurance as to the supplies likely to be forthcoming each season, which is the prime essential for the establishment of industries dependent upon the raw products of the soil. The absence of information in regard to these matters hinders the development of trades and occupations ancillary to agriculture, as no one will establish a business without some certainty as to supplies. The gambling element and uncertainty of the present day must be overcome before farming can claim to be a staple industry, and assume its proper place in our economic existence. The collection and publication of statistical information with regard to the requirements and fluctuations of markets and the demand for certain commodities are just as necessary as



are statements in regard to available or prospective supplies of live stock and produce. If such information were forthcoming it would be possible to regulate production and prices, which would tend to avert the alternating gluts and shortages which are so noticeable a feature of young countries.

The total figures of such statistics are arrived at by the laborious and careful compilation of individual returns, which in themselves are of no significance, but collectively are of the utmost importance. It is for this reason that the neglect of a few producers to render returns may defeat the purpose in view. Unanimous and whole-hearted co-operation is, therefore, essential if statistics are to be of the use and benefit intended. To ensure general compliance with these requirements, in other countries the furnishing of any figures asked for is rendered obligatory by law, and a Bill to this effect is, we understand, to be brought forward shortly in the Parliament of the Union.

There is, of course, no end to the information that could be collected if powers and facilities existed, but in the present state of our development there are a few lines which would be especially valuable. Besides a reliable list of the occupied farms of the country, there is urgent need for returns of the acreages and yields of a few of our staple crops, such as maize, tobacco and oranges from the point of view of local needs and export, and of such speculative and uncertain but high-priced products as potatoes and onions for local use. Forecasts before harvest would be of the utmost use, as would be figures of the actual yields ultimately obtained. Figures relating to the numbers and distribution of cattle are also needed, both for the information of farmers and in view of the big projected cattle-owning concerns being established. Regarding pigs, dependable figures would be of the greatest use in connection with the new bacon factory, and for the guidance both of buyers and pig breeders. Sheep raising is a coming branch of our farming industry, and data of its growth and distribution would be of the greatest help to its further development.

A small, sound beginning on these lines, and complete as far as it goes, would be more useful and is more to be desired than an ambitious scheme with less minute precision and accuracy. Statistics to be worthy the name must be maintained on simple but precise lines, and following certain well-known

principles, so that they may be comparable one with another in years to come, and also with corresponding information from other countries.

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VICTORIA WHEAT.—An impression seems to have got abroad that Victoria wheat, the variety recommended for summer sowing, is not favoured by millers, and is consequently difficult to dispose of. A considerable number of farmers in various parts of Rhodesia were successful in growing Victoria wheat last season, although in Mashonaland the year was a particularly bad one for rust, and the wheat was therefore severely tried. The impression that the grain is not readily saleable has, however, deterred farmers from sowing again this year on a much larger scale, and in order to ascertain whether there was any truth in the rumour or not one of the leading produce firms in the country was consulted and samples submitted to them. Their reply is as follows:—

“We have examined the grain sent very carefully, and we do not see why a very fine flour should not be made from it. It is difficult to estimate the quantity which could be disposed of each year. If obtainable at 20s. to 22s. 6d. per bag, Boer meal could be milled from this wheat and could be placed on the Bulawayo market, which at present draws its supplies from the South. We should say that the consumption of Boer meal between Salisbury and Bulawayo would be equal to about 6,000 bags of wheat per annum, and considerably more could be consumed if it proves suitable for milling into fine flour.”

From the above statement we think farmers may rest assured that Victoria wheat will find a local market at a reasonable price, provided it is offered in sufficiently large quantities.

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MOLASSES FOR STOCK FEEDING.—We commend to the perusal of owners of stock a notice published at the end of this *Journal* notifying a further reduction in the railway rate upon molasses for feeding stock, which came into force on the 1st of January. Molasses are very useful adjuncts to the ordinary ration, and it is to be hoped that advantage will be taken of the concession, which brings the commodity within the range of economic possibility in Rhodesia. It will be noticed that the new rate only applies to full truck loads, and it will, therefore,



be necessary for farmers to combine their orders to secure the benefits of the concession, an example of the opportunities for co-operation in the purchase of farmers' needs.

**RHODESIAN CHARCOAL.**—Visitors to the Agricultural Show at Bulawayo will doubtless remember a striking exhibit of charcoal, which evoked much comment and admiration, and which had been prepared by an improved process of his own by Mr. T. G. Kay, of Chelmer, Helenvale. Samples were sent Home, and the accompanying report from the Director of the Imperial Institute will be read with interest:—

“The charcoal from Rhodesia which is the subject of this report was forwarded to the Imperial Institute by the Secretary of the British South Africa Company, with letter dated the 26th August, 1913. The sample, which weighed  $3\frac{3}{4}$  lb., consisted of wood charcoal. It was submitted to chemical examination with the following results, compared with the corresponding figures for rough wood charcoal and for wood charcoal cut into blocks for laboratory use:—

|                                     | Present sample | Rough wood charcoal | Wood charcoal in block form |
|-------------------------------------|----------------|---------------------|-----------------------------|
|                                     | per cent.      | per cent.           | per cent.                   |
| Moisture, etc., at 110° C. -        | 4·17           | 8·29                | 6·80                        |
| Volatile matter - -                 | 20·97          | 7·03                | 9·52                        |
| Fixed carbon - -                    | 71·51          | 82·56               | 82·57                       |
| Ash - - -                           | 3·35           | 2·12                | 1·11                        |
| Sulphur - - -                       | 0·07           | 0·15                | 0·10                        |
| Calorific value in small calories * | 7,218          | 7,413               | 7,607                       |

“The volatile matter of the charcoal from Rhodesia consisted largely of gas, very little tarry matter being produced. The proportion of volatile matter, nearly 21 per cent., is much

\* Determined by the Mahler bomb calorimeter.



higher than the amount found in European charcoals of the best quality, such as those yielding the comparative analyses quoted above. The results of the analysis and the calorific value indicate that this charcoal from Rhodesia is of good quality for use as a fuel, either for ordinary combustion or for use in a gas producer. For use in a suction gas plant its value would be but little below that of anthracite, which usually has a calorific value of rather over 8,000 small calories."

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AGRICULTURAL IMPLEMENTS IN RHODESIA.—It is noticed that persons coming to Rhodesia from the South to take up land frequently bring with them all manner of requisites in the way of wagons, implements, tools, household goods, food supplies to last for months, as if they were proceeding upon an exploratory expedition into an uncivilised country. No doubt the reduced rates accorded to settlers when first entering the Territory to some extent account for this, but on the other hand the special rates now charged for most agricultural requirements render this concession of less account than formerly.

Then the selection of articles by these newcomers is often, owing to lack of experience, inappropriate. Especially is this true as regards agricultural implements, which are often unsuited to the locality in which the newcomer ultimately settles, while makes are brought up of which it is not easy and frequently impossible to obtain spare parts or accessories at short notice. This is not the case with the locally-stocked makes, and no difficulty need be feared in this connection.

Farmers here should advise their friends coming in that all their requirements are readily obtainable at various centres, and that as regards ploughs, planters and the like, it is better for the settler to benefit by the experience of his neighbours rather than to risk introducing at some expense articles which, however well they may have served him elsewhere, may prove unsuited to the new conditions.

There is, not unnaturally, considerable dissatisfaction in local commercial circles, too, at the loss of trade occasioned in this way, and it is but fair that the sister industries which are so inter-dependent with that of agriculture should be duly supported.

## A Pure Seed Supply for Southern Rhodesia.

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By H. GODFREY MUNDY, F.L.S.,  
Government Agriculturist and Botanist.

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During the 1913 session of the Rhodesia Agricultural Union Congress, and after lengthy discussion, a resolution to the effect "that the Government be asked to exercise some supervision over the public sale of seed maize" was adopted. The mover and seconder of the resolution contended that much of the maize offered as seed in Rhodesia was of a very inferior character, and instances were cited where farmers had suffered considerable financial loss from this fact. Several speakers opposed the motion, both on the grounds of a general objection to regulating sales of seed by means of legislation, and also because it was felt impossible "to legislate for a guarantee on seeds imported from other parts of South Africa." The writer, in speaking to the resolution, pointed out that for the last three years the Department of Agriculture had been prepared to advise and act as intermediary between prospective buyers and sellers of reliable seed, but that very few farmers had availed themselves of this offer. An extension of the system was advocated which, however, to be effective must receive the whole-hearted support of the farming community. In order to prepare the way for such extension, and at the same time to ascertain what degree of support it would be likely to secure, a circular letter to the following effect was forwarded in March last to all farmers' associations and also to certain local firms interested in the seed trade:—

"As an outcome of the resolution brought forward at the recent Agricultural Union Congress requesting the Government to take steps to control the supply of farm seeds offered for sale in Rhodesia, the following proposal is placed before

the members of your association. The scheme is in the nature of an experiment, having for its object the regulating and encouraging of a pure seed supply, and at the same time the bringing together of buyers and sellers of reliable locally-grown seed. It need hardly be emphasised that to render the system effective growers of such seed must be prepared to sell on guaranteed sample, and would-be purchasers should shew their appreciation of this fact by supporting and placing their orders with such growers.

“Any farmer having pure seed for sale may forward a half-pound sample of the same to the Department of Agriculture, at the same time giving full particulars of origin, how bred and selected, quantity available for disposal, and price f.o.r. nearest railway station or siding. The vendor should undertake to supply, in quantity, seed of equal quality to and conforming with the description of his sample deposited with the Department of Agriculture.

“Should the sample not be considered sufficiently good for seed, it will be returned to the grower and he will be informed accordingly. Thus, only seed of high quality will receive the recommendation of the Department. Where, however, the quality is sufficiently high, and the pedigree or description of origin adequate, the sample will be retained and farmers enquiring through the Department for this class of seed will be placed in direct touch with the grower.

“A purchase of seed having been effected, should the *purchaser* consider the seed inferior to the description given, it will be competent for him to submit samples to the Department, where they will be compared with the guaranteed sample originally deposited by the grower. As a condition of this work being undertaken, it will be necessary for growers and purchasers alike to agree to accept as final, and abide by, the decision of the Department as to whether seed supplied conforms with guaranteed sample or not.

“For these services no charge will be made.

“It should be clearly understood that the system is equally applicable in the case of merchants handling locally-grown seed, the only difference being that in this case the mer-



chant should forward to the Department, with the sample, a letter from the grower describing and giving full particulars regarding the origin of the seed.

“The Department cannot undertake any direct liability in the matter, but, to safeguard the interests of both buyer and seller, there might be a mutual agreement that should the bulk supplies prove below the standard of the guaranteed sample, the seller should have no claim for payment against the purchaser.”

To this letter replies expressing the views of sixteen farmers' associations were received between the months of March and November, while eleven associations failed to give any definite expression of opinion. The majority of associations approved of the system, but several expressed a fear that if the last clause were agreed to sellers might be victimised by unscrupulous buyers. In addition, the Salisbury Farmers' Association held that the sale of seed maize on the cob should be further encouraged, while Hartley considered the Department's examination should include germination tests. The Que Que Farmers' Association advocated the system being applied to *imported* as well as to locally-grown seed.

The question of seed control is surrounded by many difficulties, and it is well nigh impossible for the present to formulate any scheme which will meet all requirements. What must be aimed at is a system which can gradually be extended, and which will serve to educate public opinion on the importance of pure and reliable seed. The suggestion has been made that an official of the Department of Agriculture should be employed to personally inspect supplies of seed offered for sale by farmers and seed merchants throughout the country. To perform this inspection in Rhodesia in such a way as to give general satisfaction would require the entire time for several months in the year of more than one official, and this presents obvious difficulties which at present cannot be overcome.

As regards germination tests, these are not of primary importance with maize, since, under present methods of handling, even commercial grain will almost invariably germinate 90 to 95 per cent., unless it has been frosted—a very rare occurrence—or injured by insects after planting. While

the principle of selling seed maize on the ear is without doubt the correct one, there are difficulties here also, especially in the care in packing, which must be exercised by the supplier. Each consignment of seed sold in this manner should be packed in wooden crates, to prevent injury to the ears; while, further, such method of sale would considerably increase the cost of railage per 100 lbs. weight of seed. This is a question for farmers themselves to decide. In principle it is undoubtedly correct, and the most feasible means of encouraging it would appear to be by giving greater inducements for seed so exhibited at our local agricultural shows. By such means public opinion would gradually be educated to differentiate between commercial and seed maize; the present maize exhibits, which simply demonstrate size and uniformity of grain, having comparatively small value to the farmer requiring selected pedigree seed.

The question of applying a similar form of examination to imported seeds gives rise to several objections, one of the most important being the fact that seed of certain crops grown in Rhodesia—such, for instance, as lucerne, mangolds, carrots and various garden crops—can probably be produced to best advantage in Europe, and that, consequently, to discourage the importation of such seed would be to our own disadvantage. Few, if any, seed merchants, if they can avoid it, are prepared to supply seeds under a hard and fast guarantee, and on the other hand almost all insert a clause in their catalogues guarding themselves against liability for inadequate description, purity or productiveness, and repudiate all responsibility once the seed has been despatched from their warehouses. Legislation controlling the sale of farm and garden seeds, therefore, usually takes the form of an enactment whereby all seed offered for sale by any person, in a condition purporting to be ready for use by the farmer, must be contained within a package having somewhat the following information given upon it:—

- (a) the full name and address of the seller;
- (b) the name of the seed or seeds;
- (c) the purity percentage;
- (d) the vitality percentage.

The farmer is then in a position to choose the seed which will best meet his particular requirements.



Before such legislation can with advantage be introduced, it is necessary that the State should be provided with adequately staffed and equipped seed testing laboratories to which merchants and farmers can submit seed samples for analysis. In this connection, and in justice to South African seed merchants, it is only fair to point out that, all things considered, the purity and vitality of seeds supplied in South Africa will as a rule compare to advantage with seed offered for sale in any other country with which the writer is acquainted. An exception, however, is found in the case of wheat, oats, barley and rye grown and sold in the South African Union, and which almost invariably contain such a large percentage of darnel (cheat) or drabok (*Lolium temulentum*) seed as to render their use on a clean farm highly undesirable. Many complaints on this head have been received, and if the seed merchants and growers of the Union are, as they appear to be, unable to offer adequately cleaned seed, Rhodesian farmers must be prepared to pay rather more for the seed, and insist, wherever possible, on its being imported from overseas, as can be done in the case of Early Gluyas wheat, Algerian and New Zealand oats, and other varieties. It is infinitely cheaper in the long run to pay a few shillings more per hundred pounds and to secure clean seed, than run the danger of infesting our farms with troublesome weeds such as drabok.

Let it be clearly understood, however, that wherever possible Rhodesian farmers should make a point of growing their own seed, and this can well be done with the majority of our crops, such as maize, beans, wheat, cowpeas, ground-nuts, dhal, millets, teff grass, melons and pumpkins, sunflower and buckwheat. If our requirements of these were produced within the country there would be comparatively small need for importations, either from overseas or the South African Union, except in the case of lucerne, root crops, and garden and flower seeds.

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Many farmers are somewhat uncertain regarding the desirability of change of seed. Some years ago there existed a feeling throughout the agricultural world that change of seed every few years, no matter under what conditions it had



been grown, was desirable. We now realise the great value of acclimatisation and selection of seed, and thus it becomes the aim of every farmer, so far as is possible, to obtain reliable seed in the first instance, and from this to select and propagate each year for his own use, and perhaps for sale also. These remarks do not, however, apply entirely in the case of potatoes. Only under the conditions enumerated below is a change of seed to be recommended:—

- (a) when better quality seed or seed of better yielding strains is obtainable elsewhere;
- (b) when seed of the variety being grown has become mixed with other sorts or is foul with weed seeds;
- (c) when quality of seed has been seriously impaired by unfavourable weather conditions or other agencies;
- (d) when means are not available for adequately cleaning the seed.

Under such conditions it is well to obtain fresh supplies, but in all other cases good sound seed, grown on the farm and given adequate selection, may be expected to prove more productive than similar seed introduced from another part of the country or from a different class of soil. As regards the first proviso, namely, securing seed true to type, this will be provided for under the arrangement previously outlined. In the case of seed maize, supplies can be obtained from the Government Experiment Farms, where it is grown with the primary object of enabling farmers to establish seed plots on their own farms with strains already improved by selection. It is to be remembered that seed with a good pedigree behind it, even though perhaps less attractive to look at than carefully sieved seed from unselected parents, will almost invariably give better results.

To turn again to the question of pure seed supply, it will now be obvious that the best course is to grow our own acclimatised seed of all those Rhodesian crops previously mentioned, and there are few who will question that this may be done. Who among our leading maize growers would now consider importing his seed maize from America or even from the South African Union? If this can be said of maize, it

applies equally to many of the other more important Rhodesian crops.

When the writer was recently visiting Canada, he was much impressed by a farmers' organisation known as the Canadian Seed Growers' Association, which has for its object the advancing of the interests of seed growers and farmers throughout the Dominion. This association has now become an important factor in the agricultural life of Canada, and exerts an enormous influence over the production of pure seed. The membership runs into four figures, and each member undertakes and binds himself to produce pure seed under the most up-to-date system of seed selection, as laid down by the rules of the association. The seed is secured in the first instance from other reliable growers, or sometimes from the Government Experiment Stations, and is then grown in special seed plots. Careful selection from the seed plot is practised each year, while the balance of grain from the seed plot is used to sow the multiplying plot, which provides seed for bulk sowings on the farm and for sale. It is not within the scope of this article to deal with the management of the seed plot and the multiplying plot, reference to which will be found elsewhere in this issue of the *Journal*.

All seed grown by members of the association is inspected during the growing season by officers of the Department of Agriculture appointed for the purpose, and again after it is threshed and bagged. Seed which passes the examination is registered, the bags are sealed with the association's seal, and bulletins are published giving the names of registered growers, and the kinds of seed they can supply. The work of the association is regarded as a voluntary extension of the work of the Department of Agriculture, in that it exercises control over the superior strains of seed disseminated through Canada, and thus ensures that not only is the standard maintained, but is improved upon.

It is not suggested that a scheme of this nature can at once be brought into force in Rhodesia, but there is no reason why something on the same lines should not be initiated through our local farmers' associations, with very beneficial effects to Rhodesian farming generally. Meanwhile the Division of Agriculture and Botany will gladly give all possible assistance to any farmer making a commencement in growing pure seed



in the manner indicated, and visits of inspection can also probably be arranged. In this way we shall be working towards the point of excellence already reached by the Canadian Seed Growers' Association.

This ideal cannot, however, be achieved at once, and meantime the best must be done with the means available. The first step which it is here intended to propose is that outlined in the circular letter previously quoted. Under this scheme any farmer or seed merchant having reliable locally grown seed for sale may forward a quarter-pound (quantity reduced from that previously suggested) sample to this office, at the same time giving full particulars regarding name of variety, origin, how bred and selected, quantity available for sale, and price. At the same time the seller must undertake to supply in bulk to purchasers seed of equal quality to the sample deposited with the Department. Only those supplies sufficiently good will be recommended, and all enquiries for seed will then be referred to growers or merchants who can offer the variety required. In cases of dispute, the verdict of the Department must be accepted as final by all parties concerned. Whether a seller undertakes to relinquish all claim for payment in cases where the Department of Agriculture finds that the bulk supply is not equal to the guaranteed sample, or whether he stipulates that the seed is returned to him at his own expense, is a matter which each seller must decide for himself, notifying the Department accordingly when he forwards his sample. There is little doubt, however, that the breeder who will back his integrity to this extent is deserving of the maximum support from buyers, and should be able to rely upon securing the highest price for his seed. No charge will be made by the Department, and it is hoped that all interested, either in the sale or purchase of reliable seed, will give the scheme their very real support.

The writer would further recommend that those farmers who already aim at producing improved seed of any description should undertake the work more systematically, by establishing their special breeding and increase plots, in the growing and management of which they may be assured of the cordial assistance of the officers of the Department of Agriculture.



## The Breeding and Feeding of Pigs for Bacon Factory Purposes.

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By R. C. SIMMONS, Department of Agriculture.

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In view of the fact that a bacon factory is in course of erection in Salisbury, the question of the breeding and feeding of swine for bacon purposes comes within the scope of practical farming economics. Provided the right sort of pig is produced, there should be little fear of a repetition of the unfortunate results which in some cases attended previous efforts in this direction. One may now set to work to get together good pigs and to make adequate provision for them, in the assurance that there will be a market for properly fed hogs when produced. I say "properly fed," because herein lies the crux of the whole question. The factory is being designed to deal with up to fifty pigs per week only, but with provision for future extension. Should a greater number of suitable pigs be forthcoming, it will be a comparatively simple matter to make arrangements to deal with them. On the other hand, no bacon factory in the world can successfully deal with improperly fed pigs. The watchword, therefore, of the pig breeder and feeder from first to last must be *quality*. One would have liked to have been able to present to the public information on pig breeding and feeding which had been obtained by direct scientific experiment here in Rhodesia, but at present this is not possible. It is proposed, therefore, to deal with the subject rather from a general point of view, giving such data as have a world-wide application, and the results of such experiments as have been conducted in other countries under conditions somewhat similar to our own. It is hoped thus to provide, as it were, a basis from which each individual breeder who is sufficiently interested may start to make investigations on his

own account, and thus assist in arriving at some definite knowledge of the best breeds of pigs for Rhodesia and the best methods of breeding them.

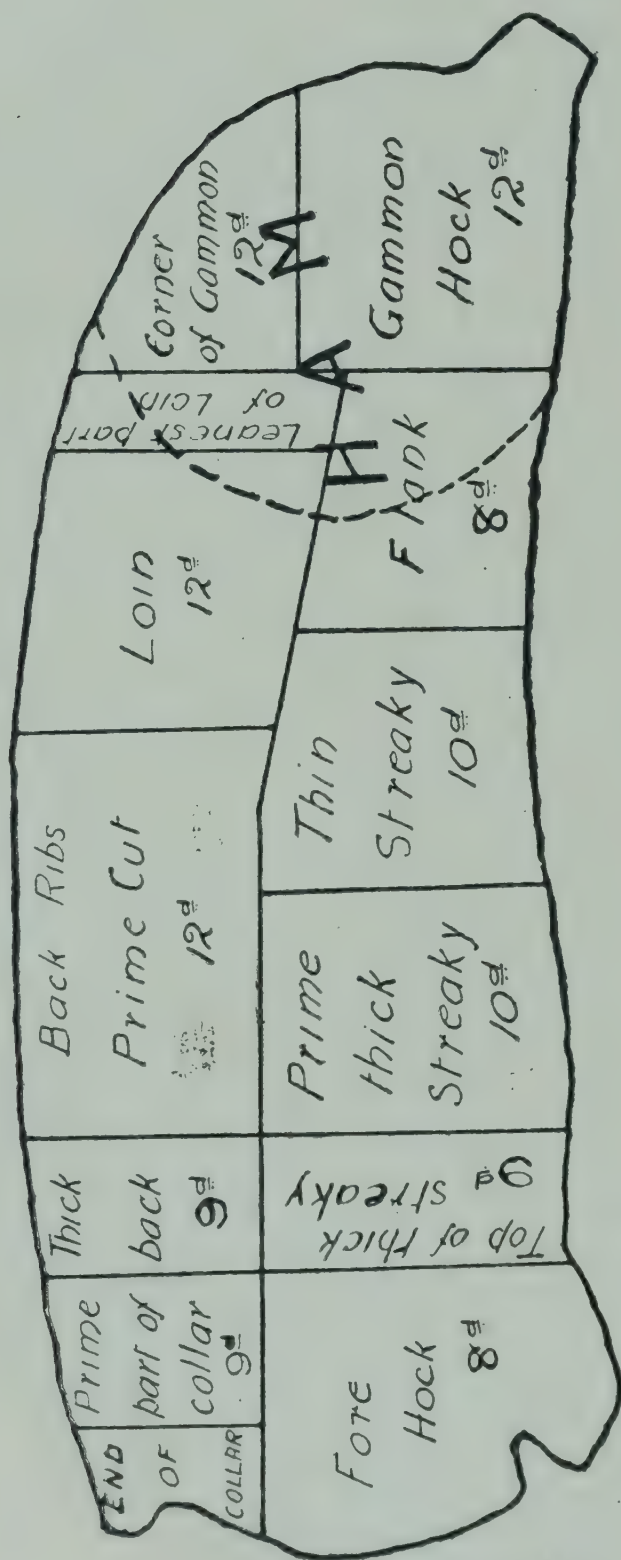
**A SIDE OF BACON.**—The ultimate aim of the pig feeder, so far as this article is concerned, may be considered to be the production of a side of bacon. The accompanying diagram, taken from the “Douglas Encyclopædia,” illustrates just what a side of bacon is. The names of the various cuts are those in general use. For the purpose of shewing the relative value of the parts, the price of the gammon or most valuable part has been taken as being 1s. per lb., and the various other parts have been priced accordingly. A brief study of the diagram will make it clear to the breeder that some parts, as for instance the ribs, loin, gammon or ham, the thick streaky and thin streaky, are more valuable and saleable than others, such as those parts lying about and in front of the shoulder. It is obvious, therefore, that in the selection of breeding pigs, one should choose those tending towards weight and full development in the more valuable parts, and fineness in the cheaper and less desirable parts.

**THE BACON PIG.**—A description of a good bacon pig is quoted verbatim from Mr. J. H. Grisdale, of the Central Experiment Farm, Ottawa, Canada. If studied in conjunction with the foregoing, the reason for such qualities as are indicated will be easily understood:—

“Bacon hogs ready for market should possess long, deep bodies, with a straight or slightly arching top, and straight underlines. The shoulders should be fairly upright, joined closely to the body, and rounded nicely over the top from side to side. The bodies should not, however, be any thicker through the shoulders at any points more than half way up from the underline to the top line than through points at a similar height situated between the shoulders and the ham. The croup should slope but slightly from the loin to the root of the tail. It should be a good length, and should maintain its width throughout, which width should be the same as that of the body and shoulders. In short, a straight-edge laid against the side from the shoulder point to [near] \* the tail should

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\* Ed.



A Side of Bacon, shewing relative value of various cuts (after Douglas).



touch at every point. The ribs should spring out well from the spinal column, but should fall in fairly vertical lines once their greatest curvature is attained, thus making a deep-bodied rather than a round-bodied animal. The body should be carried on good, stout, clean, straight-boned legs, free from weakness at the pasterns, and with square-set hocks. The feet should be strong and compact, the animal standing straight up on its toes. The neck should be of medium thickness, with no tendency to coarseness. The head should be clean cut, and free from flabbiness at the jowl."

To this should be added:—The hair should be fine, the skin fine and not too thick, the body free from roughness and wrinkles, and there should be a general appearance of thriftiness.

**THE SIZE OF PIG REQUIRED BY A FACTORY.**—The average live weight should be from 150 to 200 lbs.; bigger pigs than this are not required. It should be remembered also that the most readily saleable are those having a good even, firm covering of flesh, with a large proportion of lean meat, thick and firm in the belly parts. Very fat, lardy pigs, especially those with excess of fat on the back and on the inside of the belly, can only be used for second-class produce. A well-fed pig, as a rule, will dress out about 25 per cent, less than his live weight. He will probably lose 4 to 5 lbs. in live weight as the result of a long journey by train or wagon to the factory. This latter loss is usually obviated to some extent by resting the pigs before killing. Sows that have raised litters, old sows, boars, old castrated boars or "stags," can only be classed as third-class produce. The primest bacon is produced from young sows or barrow pigs from seven months to ten months old, or thereabouts.

**BREEDS OF PIGS SUITABLE FOR BACON.**—To manufacture a first-class carcase of pork from an ill-formed or badly bred pig is an impossibility. Every care, therefore, should be taken to select breeding animals which conform to the requisite shape and appearance, and which are known, by reason of their breeding, to possess the qualities of hardiness, thriftiness, early maturity and quality of flesh. Most British breeds fulfil the requirements of the factory in a greater or lesser degree. The chief of them are as follows:—

*Berkshires*.—Black pigs with a white blaze on the face, white feet, and a white brush to the tail. Medium size, head broad and fleshy, well-dished face, thin pricked ears rather inclined forward, jowl full and well into the neck, chest wide and deep, back long and straight, rather inclined to arch, ribs well sprung, belly full and thick, hams broad and deep and fleshed down to the hocks, legs short and straight with good bone and well set apart. Action smart and active. A good, thrifty, very early maturing pig, not quite so prolific as some other breeds. Said to be good grazers, but in the opinion of the writer more particularly suited for the dairy farm, with a view to keeping in comparatively small areas and feeding fairly highly from birth. Berkshires cross well with either of the well-known breeds, such as Large White, Tamworth, and Large Black.

*Large Yorkshires*.—White pigs of good size, in shape very nearly ideal bacon pigs. The face is long, light, and wide between the ears, not so dished as in the Berkshire. Ears are large, fringed with soft hair, and inclining slightly forward. They carry a large proportion of lean meat. The sows are docile, good milkers, and very prolific. The boars are very impressive, and, when bred to sows of other breeds or cross-bred sows, usually stamp their characteristics on the progeny in a marked degree. Robust and healthy, but, on account of their white skins and consequent liability to sunburn and other skin diseases, they are not quite so well suited to this country as black breeds. They cross well with the Berkshire and Large Black. A pure Yorkshire boar on sows of either of these breeds usually produces most satisfactory baconers.

*Middle Yorkshires*.—White pigs, really the result of crossing the Large and Small Yorkshires. They resemble the Berkshire rather in type. The head is short and light, and the face dished; the ears thin and pricked, with a fringe of fine hair; the hair is long and plentiful. They are noted for docility, early maturity, and lightness of bone, but are inclined rather more to fat than the Large Yorkshire. In view of the refinement in the Large Yorkshire which has taken place in recent years, the difference between the two types is not nearly so marked as formerly.

*Small Yorkshires* are not suited for bacon production, being too inclined to produce fat.



*Tamworth*.—In colour, a golden red hair on a flesh-coloured skin. Head fairly long, snout moderately long and quite straight, face slightly dished, ears wide with fine fringe, carried rigid, but inclined slightly forward; jowl small and light, neck long and muscular, bacon parts well developed.

Mr. H. W. Potts, Principal of Hawkesbury College, New South Wales, says of the Tamworth breed:—"Formerly they were long in the leg and snout, flat and light in the rib, very hard fleshed, slow in maturing, none too gentle in temper, but at all times good for bacon. Now we find them vastly improved, true to colour, well sprung in the rib with level tops, broad loins, deep and long sides, and tail well set up. They occupy an important position in the improvement of grade and common stock. Where they have proved valuable is in crossing with grade or common sows, and, further, in imparting vigour, size and prolificness to over-refined pure breeds. Wherever it is found that a breeding effort has resulted in an over-production of fat, the introduction of Tamworth blood reduces the tendency."

*Large Black*.—An entirely black breed, with a fairly long snout, and large drooping ears set forward over the eyes. The jowl is moderately heavy, the neck long and muscular, the shoulders oblique and fine, and the bacon parts well developed, with the exception of the hams, which slope too much. The skin is fine and soft, and the hair straight and silky. Although this breed can be grown to a considerable size, the quality of the meat is excellent, the fat being especially firm and white and free from blubbery texture. They are excellent grazers. The sows are docile, prolific and good mothers. They do not mature very quickly in this country, but their black colour renders them very suitable to exposure to strong sunlight. Modern pigs of this breed do not withstand wet and cold well, and this factor, though negligible as far as this country is concerned, probably accounts for them not being more popular in the Old Country. They cross well with the Berkshire and other compact, early maturing breeds, correcting any tendency to blubbery fat production.

The above list does not by any means exhaust the available pure breeds, many of which, particularly the American breeds,



are good bacon pigs, but it is thought that, for the present at any rate, we need not concern ourselves with other breeds, and that one or other of those mentioned will meet our various requirements.

CROSS-BREEDS AND GRADES.—A cross-bred pig is the progeny of a pure-bred boar and a pure-bred sow of different breeds. A grade pig is the progeny of a pure-bred boar and a cross-bred or mongrel sow.

It has been found that in the endeavour to develop the various qualities of most pure-bred pigs, some have been prominently developed at the expense of others. Close breeding to obtain fixity of type has somewhat impaired the fecundity of the Berkshire; again, breeding for early maturity has a tendency to induce the production of fat rather than lean, and so on. The result of this is that most factories prefer cross-bred pigs, and there is little doubt that a cross-bred or grade pig is usually hardier, thriftier, and fitter for bacon than the majority of pure-bred ones. The Director of Agriculture in his report on the Swine Industry of Australia, dated March, 1913, writes as follows:—"For bacon, pure-bred pigs of any of the well-known breeds are not favoured, and crosses are preferred. On the other hand, experience has shewn that cross-bred pigs are not suitable to breed from, hence the practice has arisen of keeping breeding stock of pure Middle or Large Yorkshires and Berkshires, and crossing these for the production of bacon pigs, or at most using pure-bred boars with sows of a first cross only. The first-named breed crossed with Berkshires either way is perhaps the most popular. The Tamworth, with its inadequate ham, has proved inferior for this purpose, as also has the Large Black breed. The last-named is found to mature too slowly, so that when it is at the right size it is not ripe, and when fat it is too large and old to give the best bacon. The Large Black, however, is recognised as being a good grazing pig, giving a large proportion of lean meat."

The following crosses are suggested as being likely to prove profitable:—

*Large White Boar and Berkshire Sow.*—Here we have the advantage of the sows being black, and only the boar requiring

extra protection from the sun. White will predominate largely in the progeny, but under no circumstances would it be profitable to expose pigs intended for bacon to undue sun or heat. The Large White Boar will impart hardiness and stamina to the progeny, and will correct a tendency to over-fat production.

*Large White Boar and Large Black Sow.*—In this case we have the same advantage as regards the black colour of the sows as with the Berkshire sow. The Large Black element will refine the progeny somewhat, will prevent them being too thick in the back, and extra stamina will result, as it does in nearly all crosses.

*Berkshire Boar and Large Black Sow.*—This cross results in increased stamina and increased proportion of lean meat, as compared with the pure Berkshire, and earlier maturity than in the pure Large Black. The Large Black sows being prolific and good mothers, larger and better litters may be expected than from Berkshire sows.

A very popular cross at one time was a Berkshire boar on Tamworth sows. This produced a rather hard, thick-skinned bacon, and a somewhat late-maturing pig. Nowadays, with the improvement that has been effected in the Tamworth, it is not improbable that crosses of Tamworth and Berkshire or Large White may prove profitable. The writer, however, would advise caution in this direction, and would expect such crosses to be more successful on dairy farms than where it is intended to give the pigs a wide range. All European pigs tend to deteriorate very quickly under natural conditions such as obtain in Rhodesia, and one should avoid the risk of one's cross-bred pigs throwing back, as it were, to the old type of lean, lank, late-maturing Tamworth.

A great many farmers possess grade or mongrel sows which are good animals and well worth keeping. Nature never stands still; these must therefore be improved if they are to be prevented from deteriorating. In such a case the all-important consideration is the acquisition of a really good, carefully selected pure-bred boar. Never use a cross-bred boar under any circumstances. If, in selecting the sows, one keeps carefully in view the main points of a bacon pig and qualities of



prolificness and stamina, there is no reason why first-class bacon pigs should not be produced.

In a book entitled, "Pigs and their Management," issued by the Queensland Department of Agriculture and Stock, Mr. W. R. Robinson, the author, writes:—"In my opinion, and in accord with the experience of many feeders, you will get better results and more profit out of good grade sows and a pure boar."

I have quoted Mr. W. H. Potts in this connection, in which he says that the Tamworth is such a useful animal to mate with grade or mongrel sows. I should expect this to be true in Rhodesia if the original sows are very small and weedy, but if, as is usually the case, a few fairly well-grown and robust sows can be selected, the writer would advise the use of a Large Black, Large White, or Berkshire boar, in preference to the Tamworth.

Notwithstanding the advantages of the various crosses suggested for factory purposes, the pure-bred pig is none the less valuable than formerly. Pure-bred boars are absolutely necessary, and in view of the small number of really good grade sows now in the country, it is unlikely that the demand for pure-bred sows will tend to lessen.

**SELECTION OF THE BOAR.**—A good pedigree is valuable, being, as it were, a guarantee of ability to transmit the type. The boar should be the progeny of good parents, and preferably one of a big litter. It is also important that he should come from a herd of uniform quality. A chance good specimen from an otherwise moderate herd may not be very valuable as a stock-getter. Further important points are: Length and depth of body, wide, compact and firmly set on short legs, and fine in the bone. A strong muscular development, a capacious chest and good heart girth indicating constitution. The shoulders should be wide but not coarse, well filled up and set back. The sexual organs should be prominent and well formed. The embryo teats should be full in number, distinct, and evenly placed. He should be bright and active, but docile, and free from coarseness.

**MANAGEMENT OF THE BOAR.**—The boar should be "done well" from birth, and never allowed to fall off in condition:



at the same time he should never be over-fat, but hard, healthy and vigorous. He may run with other pigs till he is four months old, when he should be separated and kept in a yard or camp by himself. He may be used for service at eight months, but if it is possible to leave him for a further three months, so much the better. All authorities are agreed that the boar should not run with the sows, but should have a separate pen well away from them. The sows should be brought to him when in heat and allowed one service on the first day of heat, and be put to him again about the third day. A boar may be allowed eight to ten sows in his first season, and thirty to forty in his second. He may serve two or three sows in one day if in good condition, and then allowed two or three days' rest, or he may serve one each day for several days at a time. If many sows are put to him he must be fed accordingly on good rich food, especially grain, and kept in condition.

**SELECTION OF THE SOW.**—The sow, besides having the essential features of the bacon pig, should be, if pure bred, of good pedigree, and in any case should be one of a good litter, and from hardy, early maturing, prolific parents. She should be compact, though broad and roomy in the quarters and loin, narrow at the top of the shoulder, and light in the second thigh. She should have 12 or 14 well-developed teats evenly placed, and she should be docile and of a kindly disposition.

**MANAGEMENT OF THE SOW.**—As in the case of the boar, the brood sow must be kept in good healthful condition (but not fat) from first to last. She should never be allowed to become weak or poor; she should be carefully watched and fed more liberally if she shews any signs of doing so. If sows are not kept in robust health when carrying or suckling young, early maturity and thriftiness in the progeny cannot be expected. A shady camp, with a lean-to shed in it, and with plenty of water and succulent, non-heating food, should, in most cases, be the best for a brood sow, except immediately before farrowing, or when the young are small. A mud wallow, such as an old dagga pit, which can be filled with water and occasionally cleaned out, is a great acquisition in a pig camp. Pigs use it to destroy lice and vermin, in addition to cooling themselves in it. A mud hole or wallow which has become foul and offensive is not a good thing, and should be cleaned out.

The sow should not be less than nine or ten months of age when put to the boar. If put at too young an age, small immature litters are likely to result. Sexual heat lasts about three days, and, if the sow be in good condition, should occur every 21 days until she is stinted. If the sow fails to "come on heat," stimulating food may sometimes induce the condition. When "in heat," she should be put to the boar and allowed one service; being put to him again about the third day for one more service.

The gestation period is 112 days, or 16 weeks; this varies a few days with some sows more or less. A fortnight or so before farrowing, the sow should be separated from the herd, and brought into a comfortable sty, with a small exercise camp adjoining. She should be well fed at this time, with a view to milk production. Foods which are fat-producing and heating should be avoided. The sty should be bedded up with short, dry litter. The sow will make her bed shortly before farrowing, and an eye should then be kept on her until the pigs are born. In the case of young sows with their first litter, it may be necessary to remove each of the young as they are born, placing them in a basket or box with some clean litter until all are born. When it is seen that the last has arrived and the sow is free from pain, the pigs may be put to her, and she will probably take to them quite kindly. Old sows, as a rule, do not require any attention. About half-an-hour after parturition the afterbirth will usually come away. This should be taken away and burned. Should a sow become savage during parturition and be difficult to handle, a good plan is to construct a small gate or hurdle, the width of the sty, and to keep this between oneself and the sow whilst taking the pigs away, and so on. The sow may be left alone with her pigs for eight or ten hours, and no food will be required until then, when a warm, sloppy, easily digested meal may be given.

**MANAGEMENT OF YOUNG PIGS.**—For two or three weeks after birth the young pigs do not require any more exercise than can be obtained within a moderately roomy sty. The sow during this period may be let out for half-an-hour now and then, but no good will be gained by letting the little ones run too early. At the end of two or three weeks, however, they may be allowed to run out round about and near the sty in the



exercise camp, egress and access to the sty being by means of a small opening not large enough to admit the sow. After a few days of this, the sow may be allowed to roam at will in the exercise camp, taking the young pigs with her. They will thus be encouraged to forage and feed for themselves, and will get all the healthful exercise necessary for the development of frame and strong constitution. Male pigs not intended for stud purposes should be castrated at three weeks old. Care should be taken not to let the sow roam too far. When feeding the sow, and when the little ones are about five weeks old, they should be encouraged to feed out of a small trough, so situated that the sow cannot get at it. Milk will be the best food to commence with, and this may gradually be supplemented by small quantities of meal to make a wash. Bran or pollard would be most desirable, but as these foods are scarce in Rhodesia, a little pea meal mixed with mealie meal will probably be the best, and as the pigs get older a little pumpkin or roots may be given. All meal should be fed sparingly to young pigs. At the age of eight weeks or so the young pigs will have practically weaned themselves, and may be taken away from the sow. Should any of them appear a little weak or backward, they may be left for a week or so longer, taking the strongest first. Having weaned the pigs, the object of the feeder is to maintain them for four or five months in a healthful, growing condition. It is not desirable to make them over fat; at the same time they must never be allowed to fall away. If early maturity is to result, the growth of the pig must be one uninterrupted progress. During the period under consideration, material is required by the young animal for the building up of muscle, bone, and nerve tissue; plenty of moisture is also required. When skim milk is available it is an easy matter to supply suitable food. If it is not, the deficiency must be made up with green and succulent forage, such as roots, ensilage, pumpkins, etc., supplemented with a little mealie meal mixed with pea or bean meal and monkey nuts. Exercise in moderation is necessary to the growing pig, but he should be subjected to no discomfort such as heat or cold, want of good water or a suitable wallow, or great distances to travel for food. At the age of four or five months the pigs may be put up into sties, or at any rate be more closely confined, and fattening may commence, with a view to producing a well-



matured carcase at about ten months of age. One often hears it said that it is impossible to produce a bacon pig ten months old in Rhodesia. On dairy farms, it is undoubtedly possible and can easily be done. On mealie farms, where separated milk or butter milk is unobtainable or scarce, it is more difficult. Many pig breeders forget that the preparation of a pig for the factory commences the moment it is born, and that any neglect in the earlier stages of its existence will surely delay the time of its fitness for the factory. Too often the young pigs are neglected till they are five or six months old, and then suddenly taken in hand and fed. Under such a system there is no wonder that early maturity is found impossible of attainment. It should be remembered that there is no economy whatever in starving a young pig to feed it up when it is old. In the end far more food is required to produce a lb. of bacon.

FEEDING.—I have endeavoured in the foregoing remarks to emphasise the importance of breeding pigs of good quality. The term "quality" includes amongst other things thriftiness, early maturity, and a disposition to lay on flesh of a good texture. "Quality," therefore, is especially desirable when intensive feeding is contemplated by reason of the much greater return given by such pigs for food received than by common or ill-bred animals. Whilst it is comparatively easy to fatten pigs on a great variety of foods, including sound marketable produce and refuse of all sorts, a great deal of judgment must be exercised in the choice of foods and the manner of feeding them, if a first-class quality of bacon is to be produced. The choice of foods again is often further complicated by the very necessary consideration of the cost of the available foods, or their value in the market as compared to the return in the form of bacon to be realised by feeding them to pigs.

In the feeding of animals, what is known as the nutritive ratio of foods must be taken into account. The body of a pig contains from 35 per cent. to 60 per cent. water, from 6 per cent. to 30 per cent. of fat, according to its condition, and from 2 per cent. to 5 per cent. mineral ash. The flesh, skin, hair, muscles and internal organs are largely composed of nitrogenous matter. The heat, energy and driving power of the body is supplied by the carbohydrates and fat. All these

ingredients are found in varying proportions in most foods. A suitable and profitable food is one in which the nitrogenous or flesh-forming substances and the carbohydrates and fat or heat-producing substances are in the right proportion and in such a condition that the animal may assimilate them in accordance with its needs and with the least waste. This proportion of nitrogenous substance to carbohydrates and fat is what is meant by the term "nutritive ratio." When we read that the nutritive ratio of mealies, for instance, is 1 : 8, we understand that mealies contain one part of digestible flesh-forming substance to eight parts of digestible heat, fat and energy-forming material. In addition to the chemical composition of food, its suitability, digestibility, palatability and the proportion of moisture which it contains must be taken into account, and, as before mentioned, its cost.

A knowledge of the nutritive ratio of foods will be found to be an extremely useful guide, but the fact that animals are not machines, and that they have appetites and individual tastes, must not be lost sight of, and one's commonsense and powers of observation must always be brought into play in conjunction with the knowledge thus obtained.

The following table (Wolff) illustrates more or less the amount and class of food required by growing and fattening pigs of various ages:—

TABLE No. 1.

| Age of Pig | Live Weight | Total Digestible Dry Matter required per diem | Nutritive Ratio |
|------------|-------------|---|-----------------|
| 2—3 months | 50 lbs.     | 2.1 lbs.                                      | 1 : 4           |
| 3—5 "      | 100 "       | 3.4 "   | 1 : 5           |
| 5—6 "      | 124 "       | 3.9 "   | 1 : 5.5         |
| 6—8 "      | 170 "       | 4.9 "   | 1 : 6           |
| Over       | Over        | 5.2 "   | 1 : 6.5         |

It will be seen, therefore, that the proportion of nitrogenous matter required is greater in the young growing animal from two to five months old than in the more mature animal of eight months and over, which has presumably done growing

to any extent, and which requires to put on flesh only. Brood sows, weighing about 200 lbs., require a ration containing about  $4\frac{1}{2}$  lbs. of dry matter per diem, with a nutritive ratio of about 1 : 6.6. Young sows intended for breeding require less food with a rather wider ratio, *i.e.*, a ratio in which the proportion of carbohydrates and fat to nitrogen is rather greater.

A portion of most foods consists of water. The following Table No. 2 gives the amount of dry matter, the digestible protein or nitrogenous substance, and the digestible carbohydrates and fat in 100 lbs. of some of our more common foods:—

TABLE No. 2.

| Food                 | Dry Matter<br>in 100 lbs. | Digestible<br>Nitrogen-<br>ous Content | Digestible<br>Carbo-<br>hydrates | Digestible<br>Fat |
|----------------------|---------------------------|--|----------------------------------|-------------------|
| Skim Milk - -        | 9.4                       | 2.9                                    | 5.2                              | 0.3               |
| Butter Milk - -      | 9.9                       | 3.9                                    | 4.0                              | 1.1               |
| Buckwheat - -        | 87.4                      | 7.7                                    | 49.2                             | 1.8               |
| Maize - - -          | 89.1                      | 7.9                                    | 66.7                             | 4.3               |
| Corn and Cob Meal -  | 84.9                      | 4.4                                    | 60.0                             | 2.9               |
| Kafir Corn - -       | 84.8                      | 7.8                                    | 57.1                             | 2.7               |
| Peas - - -           | 89.5                      | 16.8                                   | 51.8                             | 0.7               |
| Barley - - -         | 89.1                      | 8.7                                    | 65.6                             | 1.6               |
| Green Maize Stalks - | 20.7                      | 1.0                                    | 11.6                             | 0.4               |
| Maize Silage - -     | 20.9                      | 0.9                                    | 11.3                             | 0.7               |
| Potatoes - - -       | 21.1                      | 0.9                                    | 16.3                             | 0.1               |
| Pumpkins - - -       | 9.1                       | 1.0                                    | 5.8                              | 0.3               |
| Ground Nuts - -      | 89.3                      | 42.9                                   | 22.8                             | 6.9               |
| Linseed - - -        | 90.8                      | 20.6                                   | 17.1                             | 29.0              |

In order to obtain the nutritive ratio of a food, the percentage of digestible fat must be multiplied by  $2\frac{1}{4}$ , then added to the digestible carbohydrates, and the sum divided by the digestible proteins. Thus the nutritive ratio of mealies will be :  $4.3 \times 2.2 + 66.7 \div 7.9 = 9.6$ .

Table No. 3 gives the constituents of a further number of our common foodstuffs. It has not been possible to determine the digestibility of these foods. The nutritive ratio may be roughly arrived at, as stated above, and will serve as a



guide in making up trial rations. The nutritive ratio thus obtained cannot, however, be regarded as having any very exact scientific value.

TABLE No. 3.

| Food               | Dry Matter<br>in 100 lbs. | Total Amounts<br>(indigestible as well as digestible) |                    |       |
|--------------------|---------------------------|---|--------------------|-------|
|                    |                           | Nitro-<br>genous<br>Substances                        | Carbo-<br>hydrates | Fat   |
| Manna - - -        | 90.85                     | 11.94   | 65.86              | 2.73  |
| Native Beans - -   | 91.0                      | 19.74   | 57.66              | 6.34  |
| Velvet Beans - -   | 91.4                      | 27.30   | 46.72              | 5.81  |
| Sunflower Seed - - | 91.15                     | 16.84   | 9.64               | 28.65 |
| Rapoko - - -       | 89.4                      | 7.6   | 74.4               | 1.3   |
| Inyouti - - -      | 90.6                      | 11.3  | 71.3               | 4.3   |
| Majordas - - -     | 5.38                      | 0.44  | 4.12               | 0.03  |

We now see that some foods, such as skim milk, pumpkins, potatoes, although highly nutritious, contain such a large proportion of water that if the animal were fed entirely on them it would scarcely be able to contain sufficient bulk to obtain the requisite amount of solid substances, and would in consequence become "pot-bellied." Comparatively small quantities, then, of such foods must be used, supplemented with more solid food, such as maize.

Referring to Table No. 1, we find that the nutritive ratio for fattening mature pigs should be 1 : 6.5. It is unlikely that pigs will be fattened on one kind of feed only; moreover such a practice should be studiously avoided. How, then, are we to make up a mixed ration of the required nutritive ratio and containing the right amount of solid food? We have seen that a mature fattening pig requires about  $4\frac{1}{2}$  lbs. of solid food per day. Let us suppose that our available foods consist of maize, skim milk, green maize, and perhaps potatoes and a few beans.

We will take as a trial ration: 3 lbs. of maize, 1 gal. or 10 lbs. of skim milk, 5 lbs. green maize fodder. Referring to Table No. 2 we find the proportion of dry matter contained in

a hundred pounds of the above-mentioned foods, and we can therefore easily calculate the amount in any given quantity. In this instance—

|                              |   |                        |
|------------------------------|---|------------------------|
| 3 lbs. of maize              | = | 2.6 lbs. of dry matter |
| 1 gal. or 10 lbs. skim milk  | = | 0.9 „ „                |
| 5 lbs. of green maize forage | = | 1.0 „ „                |
| <hr/>                        |   |                        |
| Total                        | = | 4.5 „ „                |

which happens to be the exact amount required. To arrive at the nutritive ratio of this ration, we must take each feed separately and set down the amount of digestible protein, carbohydrate and fat contained in it. These we calculate from Table No. 2, just as we have the amount of solid matter. We then add the amounts for each kind of feed together, and calculate the ratio according to the formula given above, thus:—

| Feed.                 | Digestible Protein. | Digestible Carbohydrates. | Digestible Fat |
|-----------------------|---------------------|---------------------------|----------------|
| 3 lbs. of maize       | = 0.23              | 2.0                       | 0.12           |
| 10 lbs. of skim milk  | = 0.29              | 0.52                      | 0.03           |
| 5 lbs. of green maize | = 0.05              | 0.55                      | 0.02           |
| <hr/>                 |                     |                           | <hr/>          |
|                       | 0.57                | 3.07                      | 0.17           |

the nutritive ratio being, therefore, 1 : 5.9, or nearly as 1 : 6. As a matter of fact, this ratio is fairly satisfactory, but it is, if anything, rather narrow. We, therefore, see that we should not add any of the beans to it, they will increase the proportion of protein, but, on the other hand, a few potatoes added, being starchy food, will do no harm, and may be used with advantage.

The foregoing serves to illustrate how a knowledge of the nutritive ratio of foodstuffs may be used as a guide to the feeder. The writer, however, would emphasise the fact that a knowledge of the chemical analysis of foodstuffs without a knowledge of their action in practice may often be misleading, and the matter should always be regarded from both points of view at once. Mathematical exactness in making up a ration is not now regarded as necessary. The ration, however, should never be narrower than that recommended. Notwithstanding the fact that the pig will eat almost anything, he is, if allowed

to be, a very clean feeder, and although he has, or should have, a voracious appetite, he eats comparatively little at a time, especially when he is nearing fitness for the factory.

The following are important points to observe in giving feed to pigs:—

Never give more at one time than will be finished up clean at that meal.

Feed regularly at fixed times, and three times a day if pigs are confined to sties.

Clean drinking water should always be available; also a clean wallow for stud pigs.

All grain should be ground into meal, excepting small quantities, which may occasionally be given whole by way of a change.

Meal should be soaked rather than boiled.

Potatoes and hard roots, such as mangolds and swedes, are better cooked than raw.

Pumpkins are best given raw.

A proportion of about 3 lbs. of water or skim milk to 1 lb. of meal is the best for fattening pigs—more moisture may be used in the case of stores or brood sows when not with young.

Green foods should be given at mid-day; more concentrated foods at night and morning.

Mixed meals are more profitable than food consisting of one kind only. An occasional variety in the food is an advantage.

Flesh foods, such as the carcasses of animals that may have died from accident or disease, and slaughter-house refuse, should be avoided.

Wood cinders, charcoal or coal ashes and lime should always be available.

A little salt lick is beneficial, but brine in any quantity, such as is sometimes contained in dairy and hotel refuse, is fatal.

FEEDS.—Good pasturage is very necessary, not only for brood sows and young, which should spend the greater part of their time at pasture, but also (and especially on mealie



farms) for fattening pigs up to within a short time of sending them to the factory. The soft succulent couch grass, such as is found in vleis, near streams and river beds, usually in conjunction with patches of sweet thorn, is the most suitable veld for pigs. The creeping stems of this grass are soft and juicy; it is perennial and not easily eaten out.

*Paspalum dilatatum* is a suitable grass to sow in vlei ground for winter feed, as is also Napier's fodder. The Indian forage crop dhal is worth trying for this purpose. Beggar weed, a perennial legume, provides green food from spring to early autumn. Rhodes grass is recommended in Australia, but in this country it provides a summer forage only. Our hard, dry upland veld is not suitable for pigs.

*Lucerne* is excellent for pigs, as for all stock. It should be cut and fed from a small rack, for if thrown on the floor of the sty much is liable to be wasted. It is one of the best feeds for sows near farrowing or with young, and for young pigs. It should in all cases be fed with maize, potatoes or some other starchy food, on account of its high albuminoid content.

*Velvet Beans*.—A heavy cropper, useful either for the grain, as green food, or for making into ensilage. If grazed, the pigs should be turned in about the time the beans are ripening. If used as a soiling crop, it should be cut before the beans form. The beans themselves ground into meal and mixed with mealies help to form a well-balanced ration, especially for "topping up" pigs. The same remarks apply more or less to all forms of beans. They should be used sparingly with young pigs, as they are liable to be too heating.

*Peas* are one of the best possible crops for pigs, and fed in conjunction with mealies produce a really good bacon. Their use tends to prevent the loss of stamina and reproductive power, which is induced by an exclusive diet of mealies. Peas should not be fed alone, especially to young pigs, as they cause unthriftiness, but should always be used in conjunction with some starchy food, such as maize or potatoes.

*Ground Nuts, Linseed and Sunflower Seed*.—These are liable to produce oily, soft bacon, and should not be fed to more mature bacon pigs. They may be fed in small propor-

tions with mealies or potatoes to young pigs up to, say, five months old, and they should be highly beneficial to brood sows with a view to milk production.

*Maize.*—This crop, with which we are all so familiar, is a great weight-producer, but the grain, if fed alone, will not produce a satisfactory bacon, and, if continuously fed alone to successive generations, tends to produce loss of constitution and prolificness. If fed in conjunction with other grain having a high albuminoid content, such as beans or peas, or with skim milk and green forage, it is a most suitable and valuable feed, and is usually one of the cheapest foods available in Rhodesia.

To quote again from the report of the Director of Agriculture on "The Swine Industry of Australia":—"Pure maize-fed bacon does not keep so well as that fed on a mixed ration; but maize remains one of the chief pig feeds of Australia. On the other hand, the practice of grazing pigs on the standing maize crop, which has been advocated in Rhodesia, is unhesitatingly condemned in Australia by those most competent to express an opinion, on the ground that it tends to produce oily fat." This applies to grazing the crop, grain and all.

Mr. W. H. Potts, in his book, "Pigs and their Management," says, speaking of New South Wales:—"Experience has established the fact that greater profit is gained by grazing off than by confining pigs to sties to be fed on cut mealie stalks" (without the grain in them). He adds that in the green stage it is found necessary to add a daily supply of skim milk. The writer would suggest that a ration of green mealie stalks and skim milk would contain too great a proportion of water, except in the case of very young pigs.

*Kafir Corn* is not quite so rich a crop as maize, but may be used much in the same way. It should be remembered that the young shoots of kafir corn are sometimes poisonous. The more mature plant is quite harmless.

*Buckwheat* is a good feed, fairly rich in protein. It should be fed in conjunction with mealies, but sparingly—never more than one-third buckwheat to two-thirds other grain, as it tends to induce constipation.

*Rye* has about the same value as buckwheat, and should be fed sparingly for the same reason.

*Barley.*—This is recognised the world over as the feed *par excellence* for pigs. It should be ground into meal and fed with milk. In this country, where probably only comparatively small quantities will be grown, one would suggest feeding it in conjunction with maize and milk.

*Native Grains.*—No very reliable information is at present available in regard to the bacon-producing qualities of our native grains, other than mealies and kafir corn. From the analysis given, it will be seen that inyouti has a rather high percentage of fat, and one would expect it to produce oily bacon if fed to excess.

*Roots and Tubers.*—Potatoes should be cooked and fed in conjunction with maize and skim milk. The current price of potatoes, which varies so much, is, of course, an important factor in deciding their value as a pig feed. They contain a good deal of starch, and should be fed with some food in which the albuminoid content is high.

*Sweet Potatoes* are an easily grown and profitable crop, and form a nourishing and succulent food at a time of year when succulent food is scarce. It is a particularly convenient crop for sowing in small areas for the pigs to harvest themselves.

*Mangels, Beet, Turnips and Swedes.*—These are all excellent feeds, but in this country they are usually too expensive to be used in large quantities for feeding pigs. They are very valuable foods for brood sows near farrowing and with young. They are all best cooked.

*Pumpkins and Majordas.*—A most valuable food for pigs, and one of the cheapest means of providing succulent food in winter. The seeds of pumpkins are very nutritious. They also tend to check the invasion of worms. These fruits give the best results fed raw.

*Ensilage.*—A good substitute for grass and green food in the winter months. For fattening pigs, it should be fed in conjunction with maize and beans or pea meal.

*Dairy Produce.*—Skim milk is perhaps one of the most valuable foods for pigs. It is rich in albuminoids and water, and should be fed in conjunction with dry and starchy foods.



such as mealie meal and potatoes. There is found to be little difference in the feeding value of sweet and sour skim milk. It should, as a rule, be mixed with meal in the proportion of about three parts by weight of milk to one part of meal. It may be thinner for brood sows and young pigs.

*Whey* is not nearly so nourishing as skim milk, and should be used fresh in conjunction with other foods of high albuminoid content. When fed alone, it is liable to produce stiffness and lameness in the joints, preceded by scours.

*Butter Milk* is equal to skim milk when undiluted, but usually it contains much water. Care should be taken when feeding it to pigs to see that it does not contain the brine usually used in salting the butter.

HOUSING, ETC.—Elaborate housing in this country is not necessary, but sound, hygienic housing is of the first importance. The essential requirements for a pigsty are as follows:—Light, air, dryness, warmth in cold weather, coolness in hot weather, freedom from draughts, and easily cleanable. The sty should be constructed in such a way and of such material as will harbour vermin as little as possible. Diagram No. 1 shews the ground plan and section of a simple but effective brood sty, with an exercise run attached. The width throughout is 8 ft. internal measurements, divided into a feeding space 5 ft. and a sleeping space 6 ft., the division being merely a 6 in. curb, which serves to keep the bedding in place. Around the side of the sleeping space is a guard rail 2 in. x 3 in., about 6 in. from the floor and 7 in. from the wall. This serves to prevent the sow lying on her young. The whole sty is roofed, with the exception of the back wall, which is built up to within 1 ft. of the eaves. The walls and divisions are only 4 ft. high. Sties should be built with the back to the weather side, and possibly it may be found advisable to build up the end of a range of sties to the same height as the back wall. Two brick and cement troughs are built in, one for food and one for water. These should have outlets with plugs, for the purpose of cleaning out. The door in the back wall opens on to a run, and should be provided with a long hook and staple, so that it can be fixed open a few inches only, thus allowing the young pigs to go through, but not the sow, should

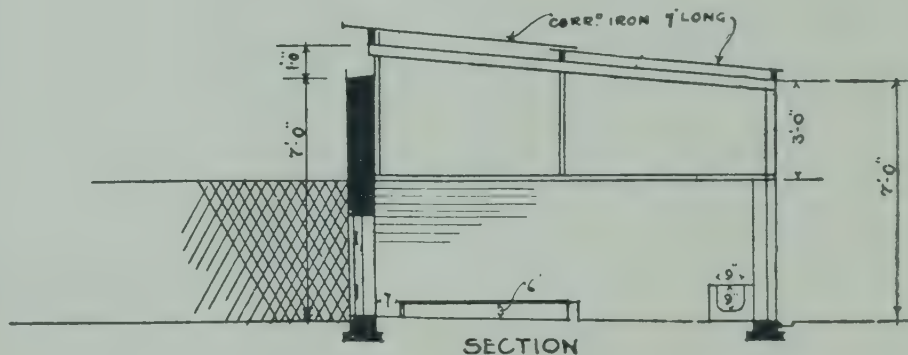


FIG. N°1. BROOD STY.

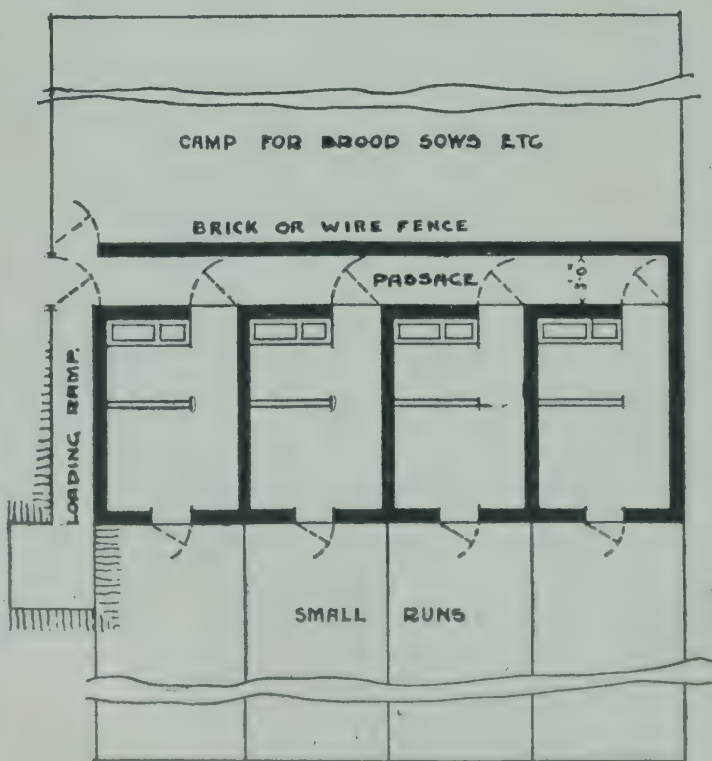
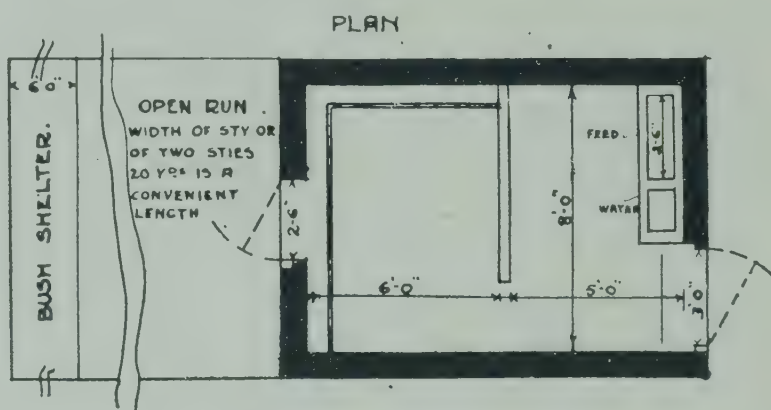
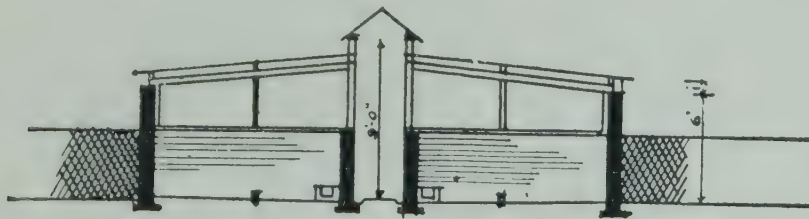


FIG. N°2.





SECTION

FIG. N°3.  
THE GROUPING OF  
SEVERAL STIES

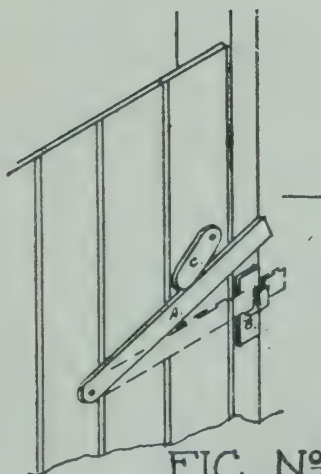
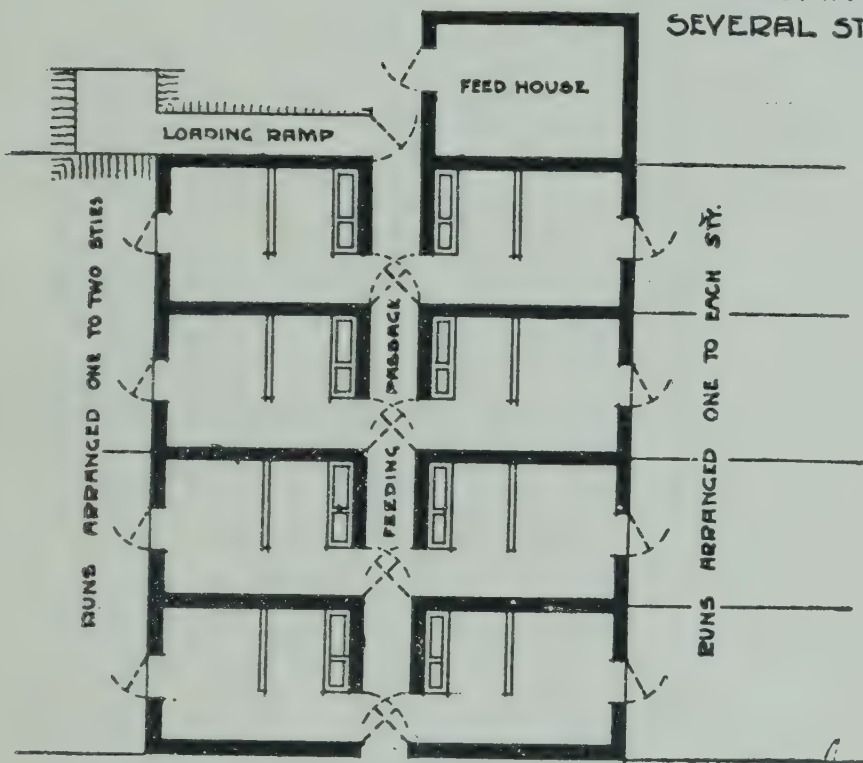


FIG. N°4  
DOOR LATCH.

Model Pig Sties.



this not be desired. A bush shelter in the run will be found advantageous, unless there is sufficient natural shelter.

A number of sties as described above may be built in a row, or in the form of a hollow square. Diagram No. 2 shews a convenient arrangement. All doors are 3 ft. wide, and the passage ways are the same width; thus pigs being loaded or off-loaded at the ramp, or being brought to and from the camps, may be easily guided by holding the doors across the passage way. Some such arrangement of buildings and camps costs little more than the same buildings placed in a haphazard manner, but an enormous saving is effected, not only in time and labour, but in the prevention of damage to pigs as the result of over-driving and chasing about.

Diagram No. 3 shews the ground plan and section of a range of sties which differ little from that shewn in diagram No. 1, except in the slope of the roof, which is from front to back, instead of from back to front. The side walls are carried up to within 1 ft. of the eaves, and have doors in them leading on to the exercise camps. In this plan also the doors and passages are all 3 ft. wide for convenience in driving pigs.

The diagrams shew brood sties only, but it will easily be seen how they may be modified by making them larger or longer, providing more trough room, and so on, in order to make them suitable for fattening pens. When building larger pens for fattening or for a number of store pigs, it is well to provide a small rack near the ground in which to feed lucerne and other valuable fodder.

**THE SITE.**—A comparatively high-lying and well-drained site should be chosen on which to build sties, but it should be so situated that the animals can travel easily to and from the grazing ground, camps, etc.

**BUILDING MATERIAL.**—The choice of material with which to build one's sties depends largely on what is available and cheapest locally. It may, however, be taken as a general rule in Rhodesia that the choice lies between brick and iron, stone and iron, all iron, or any of those materials thatched. Notwithstanding the advantage of thatch from the point of view of coolness, it is a great harbourer of vermin, and, more-

over, it is usually very expensive in the long run. Iron roofs are infinitely more satisfactory, and a little grass can always be laid on them should the heat be excessive. Iron walls, of course, are liable to be very hot. Their chief advantage is the little harbourage they provide for vermin. Stone walls, unless dressed and well pointed, are not good. In many parts of Matabeleland they become so infested with tampanas that it is almost impossible to cleanse them without destroying the building. On the whole, the best materials are brick walls, well pointed, with iron roofs, and iron or wire internal divisions. Next to this, the writer would recommend all-iron buildings, with internal divisions of wire netting. The boar's sty should always have brick partition walls. Strong wire netting partitions, reinforced with plain wire (not barbed), answer admirably for sows or bacon pigs. The best floors are of brick, laid on sand, and grouted with cement. They are not so cold in winter as floors made wholly of cement. If cement floors are used, wooden sleeping boards should be provided for sows and young in winter. In summer the pigs would not probably lie on them, as they would prefer the coolness of the cement. Cement feeding troughs are a very great convenience. They may be moulded of cement in wooden moulds, but a cheaper method is to build them in with the structure of the sty of bricks, laid in cement, and afterwards plastered with the same material. Except for feeding suckers, iron and wooden troughs are always a nuisance, and liable to be broken unless very firmly fixed.

Notwithstanding the foregoing recommendation for floors, etc., they are not absolutely necessary. Earthen floors may serve for a time if made up of sound metal. They are, however, very liable to be constantly rooted up, and on the whole it is cheaper if possible to put in brick and cement floors in the first instance.

Diagram No. 4 illustrates a convenient form of fastening for sty doors, which is easily opened by an attendant, but cannot possibly be opened by the pig. It consists of a simple wooden bar, "A," revolving on a pivot at its inner end, and dropping into an iron or wooden catch, "B." Above "A" is a wooden batten, "C," revolving on a pivot at its upper end.



To lift "A," "C" must be turned round out of the way, but on closing "A," "C" automatically falls into the vertical position and secures it.

DRAINAGE.—Sties should be drained preferably away from the bedding side towards the door, and thence under the door outside the sty with open gutters, carrying all liquid clear of the buildings into a catch pit. If there is enough liquid it may thus be conveniently used for irrigating purposes.

At first sight the expense of building in the way recommended seems somewhat disproportionate to the value of the pigs, but when it is considered that a sty properly built and costing, say, £10, will last for years, and will always be capable of housing a sow bringing in an income of perhaps £40 a year, the outlay is not so unreasonable.

TRANSPORT OF PIGS.—Having dealt with practically the whole question of pig-raising, there remains the question of the transport of pigs to market. Pigs intended for bacon must not be bruised or knocked about. A loading ramp on the farm has been recommended. This prevents a lot of bruised meat. A thin-lashed whip is the best thing to drive pigs with, and the animals should be hit, if necessary, on the legs only. Pigs should not be fed heavily immediately before loading up, but if they are to travel long distances, water and light feed should be provided at intervals. They should be kept out of the sun and heat as much as possible. It is not a difficult matter to construct hurdles or rails for a light trolley or wagon, which are easily adjustable when it is desired to transport pigs, and which form by far the best method of road transport. On hot days a bucksail may be thrown over the rails to protect the pigs from the sun. Whatever the method of transport be, the great object is to allow the animals to travel in as much comfort as possible. Over-driving, over-crowding, and so on, all mean so much off the value of the meat, and in hot weather may mean the death of the pig and total loss.

*[I have been assisted in the preparation of this article by Mr. G. N. Blackshaw, B.Sc., in matters relating to the composition of feeding stuffs, and by Mr. G. Neill, Factory Manager, in several matters, to both of whom acknowledgment is due.]*



# Report on the Methods of Growing, Curing and Selling Bright Tobaccos in Virginia, U.S.A.

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Marandellas.

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I have been assisted in acquiring the information embodied in this report by the following gentlemen:—Mr. Jas. H. Wilson, President of the Danville Co-operative Tobacco Warehouses; Mr. J. F. Lewis, Mr. Sam Warren, and Mr. J. L. Gardener, all tobacco planters of Virginia. Mr. Jas. H. Wilson is also an extensive planter, and it was through his kindness that I was enabled to see the growing and curing of the crop on the farms, and also its disposal on the selling warehouse floors.

Danville is situated on the boundary line between Virginia and North Carolina, and has the distinction of being the largest bright loose leaf tobacco market in the world. The crops sold in 1912 reached 35,919,379 lbs. This crop was sold at an average price of 14 cents per lb. The altitude of Danville is 600 feet above tidewater, and the rainfall is 35 to 50 inches per annum.

SEED BEDS.—The seed beds are usually made in a sheltered position on rich soil. It is the custom to burn brush and logs on the beds to kill vegetation seeds. The seed beds suffer very little from insect pests. The usual allowance of bed is 100 square yards to four acres of tobacco. Very little, if any, artificial watering is needed. When the planting season is late, old bed-plants are used, if not too overgrown. These, if small, are hardy, and make good field plants.

The seed beds in Rhodesia at present are costly in comparison. Insect pests are numerous. Artificial watering is costly. Owing to general climatic conditions, the raising of the tobacco plant up to the planting-out stage is a more expensive process in Rhodesia than Virginia. The variety of seed most generally used is Improved Warne, Lizzard Tail, Hester, and Adcock. Some planters favour Adcock tobacco. It has the reputation of making a high plant before buttoning.

**PREPARATION OF THE LAND FOR THE CROP.**—The land is ploughed twice, or three times if necessary, with a single-furrow mould board plough drawn by two horses or two mules. Before planting the field is harrowed with a disc harrow or toothed harrow. The rows are then laid off 3 ft. 6 ins. apart with the artificial manure drill, which drills the manure at the same time. A ridging plough is then used to ridge the soil on to the row. The ridging plough travels down the centre between two rows, and ridges half a row on each side. Ridging prevents the lands from becoming drowned during continuous rains, but serves no other purpose. The field is then ready for planting. The plants are carried to the fields in baskets. The usual distance between plants in the row is 3 ft. One man can draw and plant 10,000 plants per day. Virginian planters favour planting 3 ft. by 3 ft. 6 ins. This distance gives the grown plant the full benefit of sun and air to aid it to ripen evenly. Planting is done by hand. Artificial manure is drilled 800 lbs. per acre. The manure chiefly used is 8.3.3., which is composed as follows:—Available phosphoric acid, 8 per cent.; ammonia, 3 per cent.; potash, 3 per cent. This manure costs £4 16s. per ton, and is bought from the local merchants. The land is kept clean and open with ridging cultivators drawn by mules, also a little hand-hoeing is done. Planting machines are not used in Virginia. This is chiefly because the majority of the Virginian planters are 10 to 20 acremen, and this acreage can be planted by hand with the available labour.

It appears to me planting machines might be used in Rhodesia to save labour, providing a machine can be found that will plant satisfactorily. Artificial manure might be drilled. I would advise that an experiment of drilling manure be made to compare with the Rhodesian method of placing the

manure by hand round the plant. The manure used by Rhodesian planters is more highly concentrated than the Virginian manures. In order to aid drilling, it might be found advisable to mix the manure with dry sand, care being taken to drill the right proportion of manure per acre.

Mule cultivators should be used as much as possible. The Virginian planters depend upon mule or horse drawn cultivators to keep their land open and clean.

**TOPPING, SUCKERING AND PRIMING.**—If a good stand of plants is made from the first planting, the majority of the plants in the field are ready for topping about the same time. The plants are topped as soon as the developed bud is well clear of the leaves. Virginian planters top down to eight to twelve leaves. In the majority of fields I visited I usually found an average of 8 to 10 reaping leaves left on a plant. The top leaves, or, as they are called in Virginia, the “tips,” are nearly as large as the middle leaves of the plant. The plants are primed of sand lugs, and, as a rule, three coats of suckers are taken off. Virginian planters never let suckers attain a length of more than two or three inches. Every field I saw was perfectly clean of suckers. In comparing Virginian fields of ripening tobacco with Rhodesian fields, it struck me, in every case, that the Virginian fields ripen more evenly. I mean by this that the leaves of each individual plant seemed more uniformly ripe from sand lugs to tips than I have seen in Rhodesia. I am of opinion that Rhodesian planters are inclined to plant too close, and not top low enough. Each plant should have clear standing room to allow sun and air to reach every leaf. In topping moderately low, the tip leaves also have a greater chance to grow and broaden out. Rhodesian planters often reap and cure tip leaves, and also leaves below the tip leaves, which are too small and narrow to be of any commercial value.

I would have it understood that these notes on planting and topping more directly affect the Virginian method of reaping and curing than the present-day Rhodesian method.

**HARVESTING.**—The bright tobaccos of Virginia and North Carolina are harvested by the plant. It is only usual to string the first pullings or sand leaves to prevent losing them. These leaves are sold as primings. The field is then allowed to stand



to ripen up. The fields do not, in every case, ripen evenly, and individual plants do not ripen evenly. It is usual to see fields ripening in patches. When it is estimated that sufficient plants to fill the barn are ripe, harvesting is commenced. The plants are cut and hung on sticks as follows:—

The sticks are 5 ft. laths, and are carried and dropped at intervals between the rows of the ripe tobacco. The cutter walks between the two rows, cutting the ripe plants only in the rows to right and left of him. The stick holder walks parallel to the cutter on his left hand, having the row of tobacco between himself and the cutter. Having a specially-made two-edged knife, the cutter then selects the ripe plants, and with one cut slices the plant down the centre of the stalk from between the tip leaves to within 6 ins. of the junction of the leaf nearest the ground. With an upward cut of the inside edge of the knife he then cuts the plant, taking care not to cut with the plant any surplus of thick stalk below the last ground leaf. With his left hand he grasps the plant by the middle of the stalk, pushing his fingers between the split stalk to keep it open. He then holds the plant upside down and drops it over the stick, which the stick holder is holding ready for him. Seven to nine plants are hung on one stick. When the stick is full, the stick holder drops it on the ground, to be picked up later by the wagons. The wagons used for hauling the plants to the barns have flat bottoms and no sides. Strong, thin poles, about 6 ft. long, are dropped into mortised holes in the buck beams of the wagons at right angles to the floor of the body. These poles are placed two on either side of the wagon in the front half, about 4 ft. apart, and two on either side of the wagon on the hind half in the same manner. This leaves a small space in the centre of the wagon, where the loader stands and stacks the sticks of tobacco between the poles, butts outward. The wagons are then drawn to the barn door, and the tobacco carried in and hung on the tiers, about 10 ins. apart between sticks.

It is usual to cut two wagons' full of tobacco and then load and hang it. Great care is taken not to leave cut tobacco too long on the ground, especially if the sun is hot. The tobacco should wilt just enough to enable it to be handled without breaking the leaves.

It will be obvious to Rhodesian planters that the above method of harvesting is simple and quick, and requires very much less labour than the Rhodesian method of picking the leaf and stringing it.

The Virginian system of wide planting and low topping will now be understood. It is to enable the plant to ripen evenly.

I would suggest that harvesting tobacco by the plant might be given a fair trial by Rhodesian planters, considering the amount of labour saved by the process. I think it deserving of consideration, especially in the face of two facts—firstly, that native labour is dearer, and not so easily obtained as it was in the past; and, secondly, that the prices ruling for cured leaf are lower than formerly.

The present system of Rhodesian curing barns and fittings is suitable for plant curing, and a suggestion would be that the first harvestings of leaf be picked and strung and cured as at present, and that the main bulk of the crop be cut by the plant as it ripens. Every alternate tier could be used for hanging the plant sticks in the barn.

I was informed by many good planters in Virginia that the split stalk kills out under same heat conditions and in the same time as the lower leaf stems.

Mr. W. W. Garner, physiologist in charge of the tobacco and plant nutrition investigations of the United States Department of Agriculture, states:—"In most of the manufacturing and export districts the greater portion of the stalk is split open in harvesting, which greatly shortens its life in the barn, and in flue curing the life of the stalk is further shortened by the higher temperature used, so that there is less opportunity for the transfer of food materials from the leaf to the stalk. Under these circumstances there is less difference in yield and quality of cured leaf between priming and curing on the stalk."

**TOBACCO BARNs.**—The Virginian flue curing barns are built of logs laid horizontally and mortised into each other at the four corners; the spaces between the logs are plastered in with dagga. The roofs are made of shingles. For roof ventilation a hole 6 ins. square is left in each gable. No ground ven-

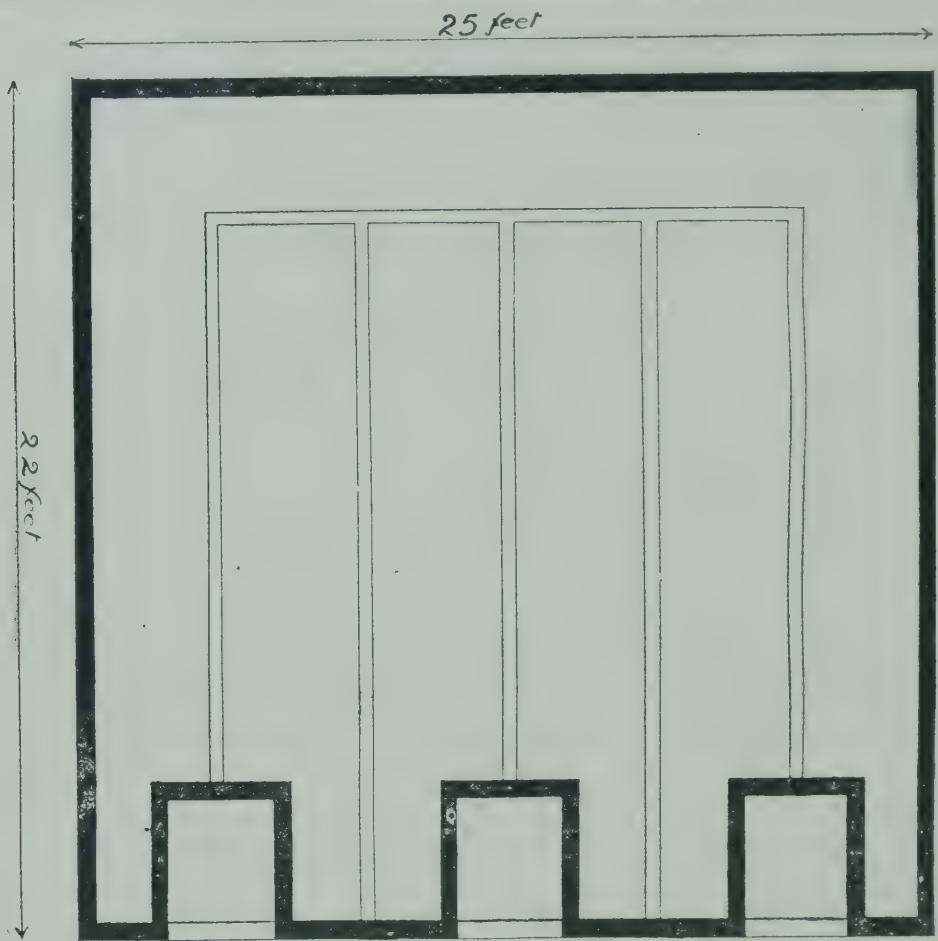


FIG. 1



FIG. 2

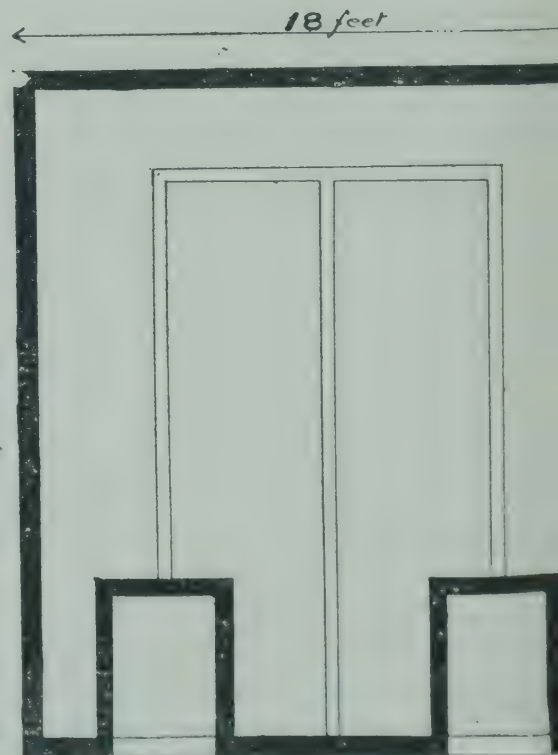


FIG. 3

Arrangement of Flues in Virginian Tobacco Barns.



tilators are used. One barn, 18 ft. by 20 ft. by 16 ft. high, is the usual allowance to every four or five acres of tobacco grown. 10 ins. to 12 ins. flues are used. These are made of 18 gauge iron. These barns cost from £40 to £60 each complete.

The accompanying diagrams shew the ground plan and arrangement of flues in three types of flue barns in use. All are 16 ft. to the eaves, with 11 in. flues throughout. Fig. 1 is for a barn curing 1,500 to 2,000 pounds at a cure. Figs. 2 and 3, 900 to 1,000 pounds. The cost of the barn No. 1 in Virginia is about £60, and the other two about £40 each.

Of the barns in use in Virginia, 70 per cent. are 18 ft. by 20 ft. by 16 ft. high to the eaves, and fitted with the Fig. 2 and Fig. 3 system of flues.

The greatest asset the Virginian planter has, compared with the Rhodesian planter, is the unlimited supply of building and firing timber ready to his hand. Virginia was at one period a dense forest of large timber. All the land now used for raising tobacco is land reclaimed from the original forest. These lands are still fringed on every side by the forest. The planter who requires straight poles for barn building, or smaller wood for firing, can generally get his supplies within a mile from where he requires them.

It will be noticed on the diagrams that the flue furnaces are built inside the barns. Virginian planters informed me that building the furnaces inside the barns saves fuel. Rhodesian planters have to consider the very limited number of flue barns compared to their acreage. This often necessitates rapid cooling of the barns after curing, in order that the leaf may be removed. Brick furnaces built inside flue barns would, I think, add to the difficulty of cooling down barns within a limited period. Virginian planters, with one flue barn to every five acres of tobacco grown, and with a naturally humid atmosphere which brings cured tobacco into high order within 24 hours after curing, need not study methods to cool off barns rapidly.

CURING.—Virginian curers have no fixed rule for curing. Weather conditions, varying ripeness of the tobacco cut,

coarse and smooth tobaccos, all need variations in curing. The period of time used in curing, from the starting of the fires to the killing of the stalk, is between three and four days. It appeared to me that Virginian curers raised their temperatures faster than Rhodesian curers after the leaf had assumed the greenish yellow or pea-green tint. When it was thought the tobacco had yellowed sufficiently at the 110 degrees of temperature, the temperature would then be raised 5 degrees every two hours up to 130 or 140 degrees, until the body of the leaf was dry. At the killing out stage, Virginian curers use great heat. It is usual to kill out the stem at from 180 degrees to 200 degrees. The curer cures the whole crop on a plantation. He does both the day and night work, and attends to his own fires, taking an hour's sleep at intervals, and longer sleep, if possible, between curings.

Appended I give a schedule of the temperatures used in one curing I witnessed. The result of this curing was good.

|              |                  |             |            |
|--------------|------------------|-------------|------------|
| Started fire | 6 p.m. Monday    | Temperature | 98 degrees |
|              | 6 a.m. Tuesday   | "           | 105 "      |
|              | 11 p.m. "        | "           | 110 "      |
|              | 3 a.m. Wednesday | "           | 118 "      |
|              | 7 a.m. "         | "           | 125 "      |
|              | 12 noon "        | "           | 130 "      |
|              | 3 p.m. "         | "           | 140 "      |
|              | 10 p.m. "        | "           | 150 "      |
|              | 2 a.m. Thursday  | "           | 160 "      |
|              | 4 a.m. "         | "           | 170 "      |
|              | 6 a.m. "         | "           | 190 "      |
|              | 12 noon "        | Fires drawn |            |

Several planters informed me that, out of 20 barns of cured tobacco, if they obtained 15 barns of bright leaf and five barns of dark leaf, they would consider this a good average. This means that 75 per cent. of bright and 25 per cent. of dark is a paying crop.

It may be of interest to Rhodesian planters if I add facts and figures of some acreages grown, number of barns used, and labour employed on Virginian plantations. Mr. Sam Warren, of Witt, Virginia, raises 40 acres of tobacco. He has 11 tobacco barns, and engages nine hands. Mr. Warren does all his own curing and firing. Mr. J. L. Gardener, of White Oak

Mountain Section, Danville, Virginia, raises 60 acres of tobacco. He has 15 tobacco barns, and engages 11 hands. Mr. Gardener cuts and barns 1,900 sticks of tobacco per day during the curing season. Mr. J. F. Lewis, of Danville, Virginia, raises 20 acres of tobacco. He has seven tobacco barns and engages six men and two boys. Mr. Lewis does his own curing and firing.

Rhodesian curers cure tobacco on the same lines as Virginian curers, the only difference observable being that the Virginian curer cures out in less time. Many Rhodesian curers use five days to kill out a barn of stringed tobacco, whereas the Virginian curer uses four days to kill out a barn of stalk tobacco.

Virginian wood fuel is lighter, straighter, and, I should judge from observation, gives out more heat in proportion to bulk than Rhodesian wood fuel.

**PILING TOBACCO.**—When a barn-full of tobacco is cured the fires are drawn, and the door is thrown wide open. Within 24 hours the tobacco is usually in high order for handling. It is then taken down and piled in the piling shed on the stick, until such time as it is required to pull it from the stalk. This is usually done after the curing of the crop is completed. The leaves are taken from the stalk, and three or four grades of tobacco are then made. The grades are made up into hands, and sold on the sale warehouse floors. Virginian planters have a great advantage over Rhodesian planters in handling cured leaf. The climatic conditions of Virginia are such that cured tobacco leaf is always in order. The Rhodesian atmosphere is of such dryness that tobacco leaf can only be handled after having been brought into order artificially.

**EXPORT.**—After the tobacco is sold by auction in the sales warehouses, it is removed by the large buying firms, who prepare it for export. The tobacco is stripped, which means that the mid rib is taken out, the leaf is then re-ordered and packed in hogsheads for export. The hogsheads are made of pine slats with white oak hoops, and hold 800 to 1,000 lbs. of tobacco each. The hogsheads themselves cost about 6s. each.



CHARACTER OF THE COUNTRY.—Virginia and North Carolina have been, and still are to a certain extent, densely timbered States. The formation of the country is very broken. It is an exception to find a level field of over five acres in extent. The greater portion of the land cleared for farming purposes is on hillsides or in narrow valleys. The soil is composed of decomposed biotite granite, which contains felspar, quartz and mica. The cultivated land is very much rain-washed, the heavy rains washing out large drains and furrows. The farm roads through these States are unmade tracks, worn into innumerable roads and trenches by the rains. Water is plentiful in the form of small streams running through the valleys.

The farmers are of two classes. The wealthier farmers are men farming their own land. These farms are from 200 to 500 acres in extent. The smaller farmers are tenants, who hire land from the larger landowners. Both classes depend entirely upon the tobacco crop for a living. Seventy-five per cent. of the tobacco produced in Virginia and North Carolina is grown by the tenant farmers. The majority of the farmers enter into one or other of the following agreements with their landlord:—

1. *Half Share Agreement*.—The landlord finds the land, farm animals, implements, and half the artificial manure; the tenant works the land, and grows and cures and sells the crops. The landlord takes half the gross returns of the tobacco sold.

2. *Quarter Share Agreement*.—The landlord finds the land and a quarter of the artificial manure. The tenant finds the farm animals and implements, etc., and grows and sells the crop. The landlord takes a quarter of the gross returns of the tobacco sold.

It must be understood that the dwelling-house and necessary barns are supplied by the landlord in both cases. Tenant farmers raise from ten to twenty acres of tobacco annually, according to the size of their families and outside labour obtainable.

ROTATION OF CROPS.—Virginian planters vary a great deal in their system of rotation of crops. Several planters informed me that they had grown tobacco continuously for ten years

upon the same land. The rotation system generally in use is to grow one crop of tobacco, the following season the land goes under wheat or rye, the second year under grass, and then back to tobacco, so that tobacco is planted every three years.

THE LOOSE LEAF SALES WAREHOUSE COMPANIES.—These companies receive and pile for sale all the farmers' tobaccos. The charges made are:—

- 10 cents per 100 lbs. for weighing;
- 10 cents per 100 lbs. for auction fees;
- 2½ cents on the dollar commission.

These companies advance money loans to farmers at six per cent. per annum on their crops, the farmers agreeing to sell their crops through the companies' warehouses.

A FEW FIGURES.—The value of farming land in Virginia and North Carolina varies from 16s. to £10 per acre. Labour costs £4 5s. per month; hirer providing food. Mules are worth £30 to £40 each. Wagons cost £10 to £13 each. A set of flues costs £3. Tobacco thermometers cost 12s. per dozen. Tobacco knives cost 12s. per dozen. Tobacco costs 8 cents to 10 cents per lb. to raise. A good average crop of tobacco should average about 17 cents per lb.

I was informed by leading planters in Virginia that Virginia has unlimited lands, but that labour, which is nearly all white, is getting scarcer and more expensive yearly, and that this is likely to curtail the development of the tobacco production of that State in the future.

## Moisture in Maize.

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By G. N. BLACKSHAW, B.Sc., F.C.S.,  
Government Agricultural Chemist.

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During the period October, 1912, to July, 1913, an enquiry was conducted into the variations which occur in the moisture content of stored maize as the result of changes in the condition of the weather. A determination of the amount of moisture present in maize, whilst as a rule uncalled for when the grain is intended for local consumption, becomes an important matter in the case of export maize, on account of the fact that the moisture in the grain at the time of shipment must be within a certain limit if heating and consequent damage in transit is to be avoided.

It is true, no doubt, that the local consumption of maize will increase, and that more uses will be found for it as stock feed on the farm, but with the rapid extension of the cultivation of maize, it seems equally certain that after good seasons there will be a surplus for export, and, moisture in export maize being an important consideration, it was decided to institute an enquiry into the moisture content of grain kept under ordinary storage conditions.

Mr. J. Burt Davy, late Union Government Botanist, in an article which appeared in the issue of the *Transvaal Agricultural Journal* for April, 1910, states that maize for export should not contain more than 12 per cent. moisture *at the time of shipment*, and draws attention to the fact that sound, dry samples of Transvaal maize containing as low as 11.5 per cent. moisture on arrival at Durban may gain as much as 3 to 3.5 per cent. moisture if allowed to remain on the Durban wharf for only a week, an increase which is sufficient to bring them above the limit of safety for export.

In October, 1912, twelve sacks of maize, selected from consignments forwarded by twelve growers to the Salisbury Farmers' Co-operative Society, were set aside in the Society's store, and, with the aid of a grain sampler, samples were taken periodically from these sacks for moisture tests, the determina-



tions being made at the Agricultural Laboratory by Mr. E. E. Philip by means of the Brown-Duvel Moisture Tester. Particulars regarding the humidity of the atmosphere during the period of the investigation were obtained from readings taken at 9 a.m. daily at the Salisbury Gaol, a few hundred yards distant from the store. (See next page.)

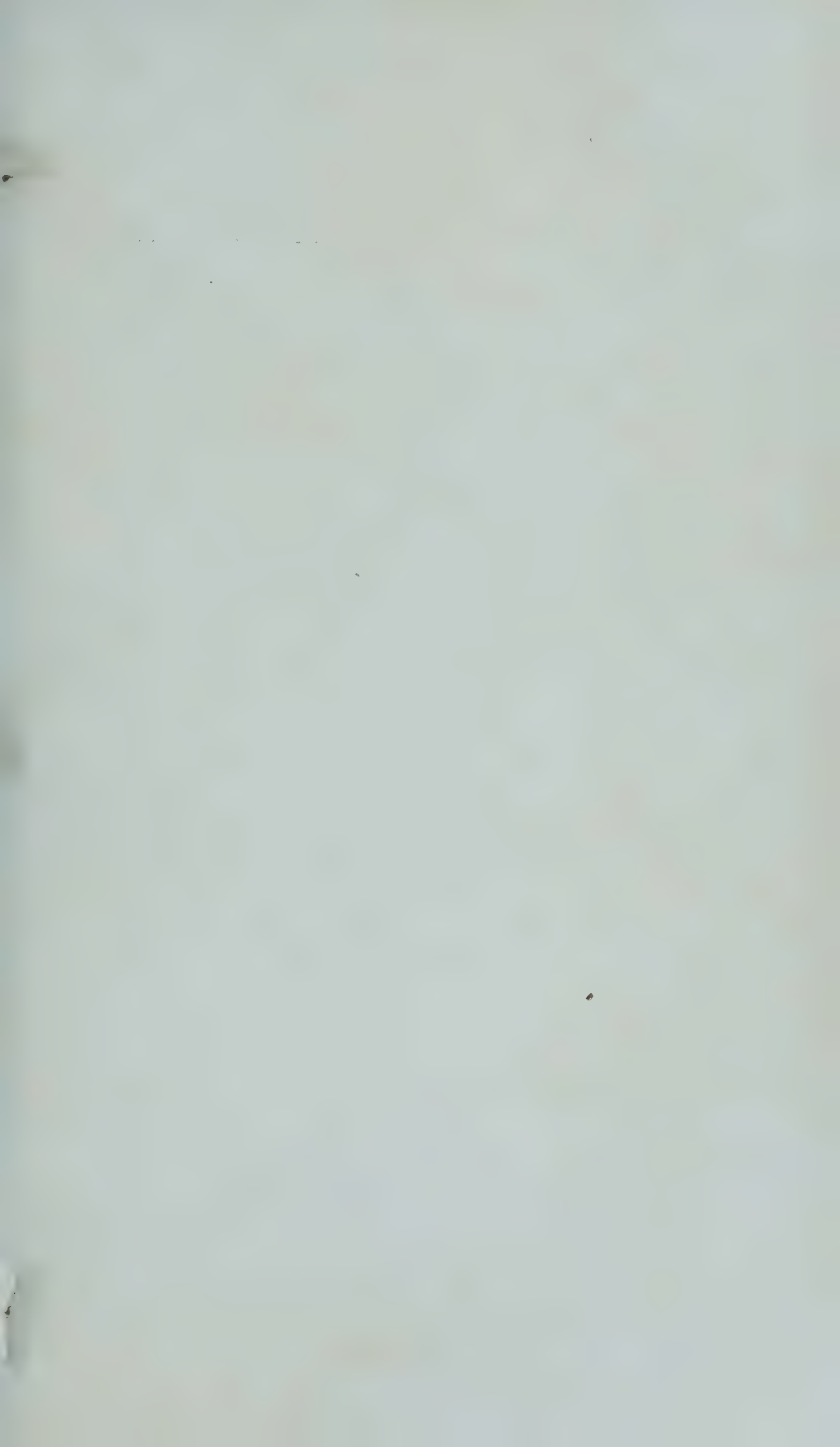
The marked irregularity in the moisture content of the samples taken for the first test (1/10/12) was doubtless due to the drying out of the grain after harvesting, the rate at which this takes place being influenced by several factors, of which the more important are the time at which the husks are removed and the time the cobs are shelled. In some cases the husks are removed at once, in others they are allowed to remain on the cobs until they are shelled, and in the latter case the rate at which the grain dries out is naturally retarded. In the second test (22/10/12) it will be noted that the irregularity in the moisture content of the samples was much less marked, the deviation from the mean of the twelve being so small as to lead to the conclusion that the drying out process was practically complete. That being so, subsequent changes in the moisture percentage are due to changes in the atmospheric conditions, and in this respect it will be observed, on comparing the mean moisture content of the twelve samples at each test with the changes in the humidity of the air, that there is a close agreement between them; the lowest and highest mean moisture contents corresponding with the lowest and highest humidity conditions respectively.

The maximum variation in moisture recorded during the period of the investigation (mean of 12 samples) was 3.72 per cent., the lowest average being shewn in the month of October, 1912, and the highest in April, 1913. In single bags, the maximum variation in moisture for the same period was 4.6 per cent., and the minimum 3.3 per cent.

Taking 12 per cent. as the maximum moisture content that may be safely allowed in maize at the time of shipment, it is clearly evident, from the results of this investigation, that during the wetter months of the year the moisture in some consignments is very near the danger point for export, and that in all cases the grain must be shipped immediately on arrival at Beira, otherwise it may absorb sufficient moisture to cause heating in transit.

# MOISTURE CONTENT OF STORED MAIZE and variations therein due to changes in atmospheric conditions.

| Date of test  | 1-10-12    | 22-10-12   | 5-11-12    | 19-11-12   | 3-12-12    | 19-12-12   | 9-1-13     | 4-2-13     | 28-2-13    | 14-3-13    | 14-4-13    | 29-4-13    | 4-7-13     |
|---|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Average relative humidity of atmosphere since previous test (saturation = 100) ...                    | ...        | 37         | 38         | 38         | 39         | 68         | 67         | 58         | 65         | 64         | 69         | 63         | 55         |
| Average relative humidity of atmosphere during week immediately preceding test (saturation = 100) ... | ...        | 39         | 39         | 44         | 48         | 70         | 65         | 63         | 65         | 65         | 75         | 58         | 57         |
| Sack No. 1  | % Moisture | % Moisture | % Moisture | % Moisture | % Moisture | % Moisture | % Moisture | % Moisture | % Moisture | % Moisture | % Moisture | % Moisture | % Moisture |
| do 2  | 9.5        | 8.0        | 7.9        | 9.4        | 9.8        | 11.1       | 11.2       | 11.0       | 11.6       | 11.2       | 11.4       | 11.7       | 10.5       |
| do 3  | 11.55      | 8.15       | 8.1        | 9.5        | 10.6       | 11.2       | 10.4       | 11.1       | 10.9       | 10.9       | 12.0       | 11.8       | 10.4       |
| do 4  | 9.8        | 8.85       | 9.25       | 10.4       | 10.0       | 11.4       | 11.8       | 11.6       | 11.8       | 11.4       | 12.3       | 11.7       | 10.6       |
| do 5  | 9.2        | 8.1        | 8.3        | 8.9        | 9.5        | 11.2       | 11.3       | 11.0       | 11.4       | 11.2       | 11.4       | 11.2       | 10.4       |
| do 6  | 10.5       | 8.3        | 8.0        | 10.8       | 10.3       | 10.6       | 11.6       | 12.2       | 11.2       | 11.4       | 11.7       | 11.8       | 10.7       |
| do 7  | 10.3       | 7.6        | 9.2        | 9.2        | 10.0       | 10.6       | 11.2       | 11.4       | 11.2       | 10.9       | 12.0       | 11.4       | 10.3       |
| do 8  | 7.1        | 7.65       | 8.0        | 7.8        | 9.0        | 10.4       | 10.2       | 11.0       | 11.3       | 10.8       | 11.0       | 11.4       | 10.2       |
| do 9  | 10.05      | 7.7        | 8.6        | 9.3        | 9.8        | 11.0       | 11.3       | 11.8       | 11.6       | 11.7       | 11.2       | 11.9       | 10.4       |
| do 10   | 7.4        | 7.9        | 8.3        | 8.5        | 9.3        | 10.8       | 10.0       | 9.9        | 11.0       | 11.0       | 12.0       | 11.8       | 11.3       |
| do 11   | 9.95       | 7.85       | 9.55       | 9.6        | 9.4        | 10.8       | 10.5       | 11.4       | 11.3       | 10.9       | 12.2       | 11.8       | 10.6       |
| do 12   | 8.1        | 7.2        | 8.25       | 7.9        | 9.0        | 10.8       | 10.9       | 10.2       | 11.2       | 10.3       | 11.5       | 11.1       | 10.4       |
| do 12   | 8.45       | 8.45       | 8.35       | 8.3        | 9.8        | 11.5       | 11.1       | 10.7       | 11.8       | 10.9       | 11.6       | 11.2       | 10.8       |
| Average of 12 sacks...  | 9.32       | 7.97       | 8.48       | 9.12       | 9.70       | 10.95      | 10.95      | 11.10      | 11.35      | 11.05      | 11.69      | 11.56      | 10.55      |





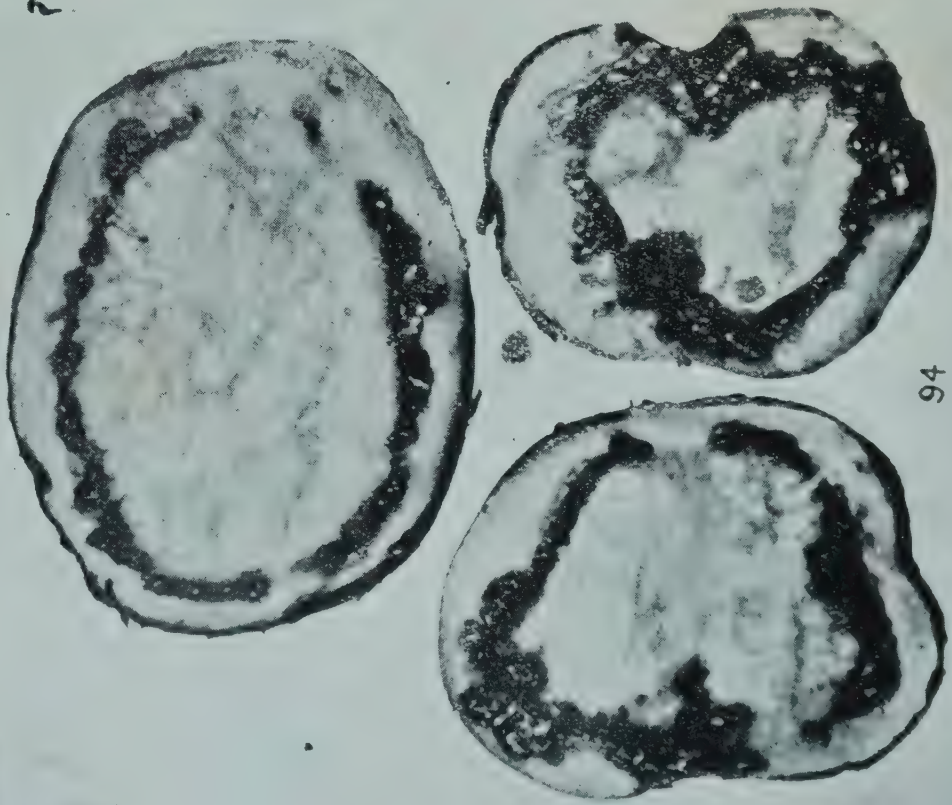
1.



R.H.J.

Corky Scab.

2.



94

Bacterial Disease.

After McAlpine.

## Diseases of the Potato Tuber and the Selection of Sound Seed.

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By RUPERT W. JACK, F.E.S., Government Entomologist.

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The importance to the potato grower of using sound tubers for seed purposes cannot be over estimated. This is especially the case where potatoes are made something of a speciality, and irrigated land is devoted to the crop. Those who have clean or new farms should pay great heed to the freedom of their seed from infectious troubles. It is well worth while to pay an enhanced price to be sure that the seed can be relied upon. Unreliable seed bought cheaply is liable to cost the grower dear in the end.

Notes on some of the troubles that may be conveyed through the medium of seed potatoes have appeared from time to time in this *Journal*; but, for the sake of easy reference, it is proposed to collect these notes and to add information concerning other diseases to form a single article, so that the uninitiated may have a ready means of learning of what to beware, and how the different troubles may be recognised. Technicalities are avoided purposely, and only such details given as lie within the power of every farmer to see without the aid of a microscope.

**CORKY SCAB** (*Spongospora scabies*).—A tuber infested with this disease is shewn at Plate I., Fig. 1. This is a very distinct form of scab, and is especially liable to be present on tubers imported from the British Isles and Europe. At the same time, it may be present on potatoes of Rhodesian origin. Corky scab is easily distinguished from other forms of scab by the turning back of the skin from the more mature scabby spots. This discloses a dark mass of spore balls, not, of



course, recognisable as such except under the microscope, which serve to perpetuate the disease in the soil. Once soil is infested, it will produce tubers defaced by this disease as long as potatoes are cultivated. According to McAlpine, it may, however, be starved out by planting a rotation of crops, as the disease has only been observed on the potato. The disease is favoured by damp soil, and under such conditions may eat its way an inch into the tissues of the tuber. Badly infested potatoes are very unsightly, and command much reduced prices. The formalin treatment (see later) is reported to be of value in reducing the disease, but is doubtfully to be relied upon. Infected tubers should not be used for seed.

SCAB.—This name is given to any rough, corky growth on the surface of the tuber. In the United States of America the trouble has been shewn to be due to a fungus known as *Oospora scabies*, and for some time “potato scab” all over the world was supposed to be due to this fungus. Plant pathologists have, however, failed to associate this fungus with the disease elsewhere, and it has been demonstrated that a similar appearance may be produced by various agencies. Much has been written about the production of “scab” by gallworm (eelworm) attack, but this form is distinct in appearance, and not likely to be confused with other kinds. A photograph of a scabby tuber is reproduced on Plate II. This tuber was grown in Rhodesia, and the cause of the disfigurement is not apparent. It agrees very closely in appearance with the form of scab stated by McAlpine to be produced by the fungus *rhizoctonia* (see under), but this appears not to be the agency in this instance. It may be described, however, as a typical “scabby tuber.” Scab may also be produced by the action of the soil on the swelling tuber. This form is common in the neighbourhood of towns in Europe where night soil is used as a fertiliser, the grit of the cinders injuring the surface of the tuber, and stimulating the formation of corky tissue. The gnawing of millipedes is responsible for “scabbiness” in some parts, and soil-inhabiting insects of various sorts have been implicated. This shews that scab is not necessarily infectious, but it may be so, as in the case of *rhizoctonia* scab, and the grower is hardly in a position to discriminate. If seed potatoes shew scab, therefore, the safe course is to soak them in a liquid which will





R. W. J.

Scabby Potato.



remove the infection, if present. Particulars concerning these liquids are given below. It is safer still not to use such tubers for seed at all.

**RHIZOCTONIA, "STEM ROT," "POTATO ROSETTE," ETC.** (*Hypochynus solani*).—At Fig. 1 on Plate III. is shewn a tuber bearing small specks of what appears to be dry black soil on its surface. If the potato is wetted, these specks shew up very distinctly. They are for the most part easily scraped off, and the skin beneath is seen to be intact. This is not always the case, as the trouble sometimes extends into the tissue. These specks, if noticed, are put down to adherent soil or fertiliser, and few pay any heed to their presence. In reality, however, they are the resting forms of a destructive fungus disease, designated by a number of different names as above. Introduced into suitable soil, the fungus is capable of developing and attacking the plants, causing rotting of the stem (hence the name "stem rot") or stunted growth and branching of the leaves ("potato rosette"). Another symptom is the production of tubers on the stem above ground. It may also, according to McAlpine, produce scab on the tubers in the form shewn at Plate II. Precisely what condition of soil and climate favour the development of the disease seems not to be known, but we may take it that a damp situation has a favouring influence.

The disease occurs in most parts of the world, in Europe and the British Isles, America, Australia, etc. It is very common on seed potatoes imported from the British Isles. It occurs also in South Africa, but in spite of the quantity of infected seed imported, the writer has not yet seen a crop attacked by the disease in Southern Rhodesia. This, however, does not prove that crops do not suffer at times. Infested tubers may be disinfected by soaking in corrosive sublimate solution.

**DRY OR WHITE ROT** (*Fusarium solani*).—At Figs. 2 and 3 on Plate III. two photographs of potatoes affected with this form of rot are reproduced. The two popular names are well illustrated by the appearance of the tubers. The tuber shewn at Fig. 2 had been kept in a glass box for some time under damp conditions, but the white fungus filaments will develop without excessive moisture. The tuber shewn at Fig. 3 repre-



sents the commonest appearance as seen in the store-room or seed-box. This fungus is practically always present amongst potatoes, and injured specimens are always liable to develop the rot. At the same time healthy tubers can be affected from diseased ones, and it has been found that planting diseased tubers results in a much larger percentage of the resulting crop being affected than is the case when apparently healthy seed is used. The soil also harbours the disease when introduced to it and affects later crops. The plants are not affected.

The rot is characterised in its early stages by a brown ring near the margin on sectioning the tuber. This develops, and the tissue crumbles away, remaining dry and hard, and the white filaments grow out from the surface. The course of the rot is sometimes complicated by the additional development of wet rot due to bacteria (see under).

Various "counsels of perfection" are given in text books of plant diseases concerning the avoidance of this disease, such as never to plant tubers from crops that shew any sign of the rot, and never to plant on land that is infected with the fungus, but this is impossible in practice, as practically all consignments of seed potatoes have a small percentage of affected tubers. Practically all that can be done is to throw out and burn all diseased tubers when planting, so as not to increase the sources of infection more than can be avoided. Tubers to be kept should be stored in a dry and airy situation, and should be injured as little as possible in handling. Massee recommends the use of flowers of sulphur at the rate of 2 lbs. to the ton to keep the fungus within bounds in the store-room.

BACTERIOSIS, "WET ROT," ETC. (*Bacillus solanacearum*). —In its early stages this destructive disease may be recognised in the tubers, on cutting them open, by a brown ring near the margin, from which whitish masses of bacteria may be seen oozing, thus distinguishing this form of brown ring from that caused by dry rot (see Plate I., Fig. 2). A most unpleasant odour is also associated with the trouble, which is absent in dry rot. The disease develops until it involves the whole tuber, the skin remaining more or less intact, but the contents being turned into a white, slimy mass of foetid putrefaction, in which the maggots of various species of flies may

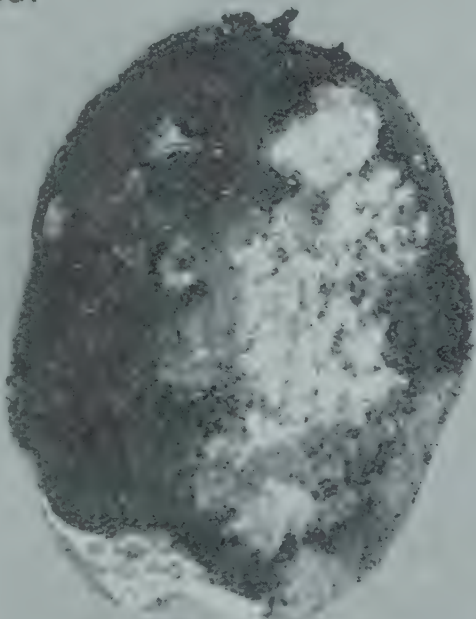
1.



Rhizoctonia or Stem Rot.

R.W.J.

2.



Dry or White Rot.

R.W.J.

3.



Dry or White Rot.

R.W.J.





be present. The rot is not confined to the tuber, but, under favourable conditions, attacks the plants, causing withering and death. A farmer in Umtali once shewed the writer the remains of a crop which had been planted on a black, damp loam in a low-lying situation. The plants were lying black and dead on the surface of the soil, and every tuber was rotted away. The farmer stated that he had not been able to raise a crop of potatoes for several years on that piece of ground. This shews that certain soils in the Territory are suitable for the development of this disease, which under such conditions persists in the soil to infect later crops. Besides potatoes, it affects all other plants of the family, such as tobacco, tomato, egg plant, etc.

Infected tubers should not be used for seed, and clean potatoes should not be planted in infected land.

ROOT GALLWORM, "ROOT KNOT EELWORM" (*Heterodera radicum*).—This pest has already received considerable attention in this *Journal*, but must be mentioned here for the sake of completeness. The appearance of an infested tuber is shewn at Plate IV., Fig. 1, whilst a section of a similarly infested tuber is shewn, somewhat enlarged, at Fig. 2 on the same plate. The cause of the trouble is a minute worm, which lies within the tissues near the surface. The mature females are swollen, and may be seen as minute, whitish specks, embedded in the tissue (see Fig. 2). The pest is not confined to potatoes, and attacks the great bulk of cultivated plants. Once introduced into suitable soil it will persist for all time, rendering the raising of crops, with the fortunate exception of maize, cereals and grasses, a matter of great difficulty. The most suitable soils are those of a sandy nature, but these must contain moisture. Irrigated lands are very liable to become badly infested, as also are naturally moist vleis when the soil is sandy. For a fuller account of this pest, the reader is referred to the number of this *Journal* for June, 1913.

This is a most insidious and destructive pest, and is most liable to occur in potatoes of South African origin, though potatoes from the continent of Europe might be infested. The pest has never been observed in consignments from Great Britain. The Department of Agriculture refuses admittance

to all consignments of potatoes found to be infested with this pest, but it is impossible to exercise control over tubers sold for seed within the borders of this Territory. Infested tubers should on no account be used for seed. No effective treatment to rid the tubers of the pest is known.

**INTERNAL DISEASE, "BROWN FLECK" OR "SPRAIN."**—This is a common potato trouble in many parts of the world, and is only too prevalent in Southern Rhodesia. A section of an infected tuber is shewn at Plate V., Fig. 1. At first glance it might seem that the appearance of this tuber is difficult to distinguish from that caused by bacterial disease, but this is not the case. There is no bacteria associated with this trouble, and there is no offensive smell. The brown areas are hard, and may be removed in lumps from the rest of the tissue with the aid of a penknife.

This is an obscure physiological trouble, the exact cause of which is unknown. The term "physiological trouble" is rather vague, but it signifies a lack of harmony between the plant and its environment. In Southern Rhodesia the disease seems most likely to occur in potatoes grown in the late winter under irrigation or in naturally moist vleis. It seems specially associated with the main crop varieties such as "Up-to-date" and "Factor," and several growers state that it develops as the potato matures, those lifted early as "new potatoes" from the same crop being quite unaffected.

This disease is not transmissible, and, under favourable conditions, affected tubers will produce a normal crop. The practice of planting such tubers is, however, none too sound, as it serves to perpetuate a strain obviously susceptible to the trouble.

**BROWN SMUDGE** (Plate V., Figs. 2 and 3).—This disfigurement is mentioned here merely that the grower may be able to recognise it. It is quite harmless as far as affecting any resulting crop is concerned. The discoloration is brought about through the tubers having been exposed to too much heat, and may easily be produced artificially. It has only been observed in imported consignments, and is probably due in most cases to the boxes having been stowed too near the engine-room. Exposure to sun on a long railway journey might have

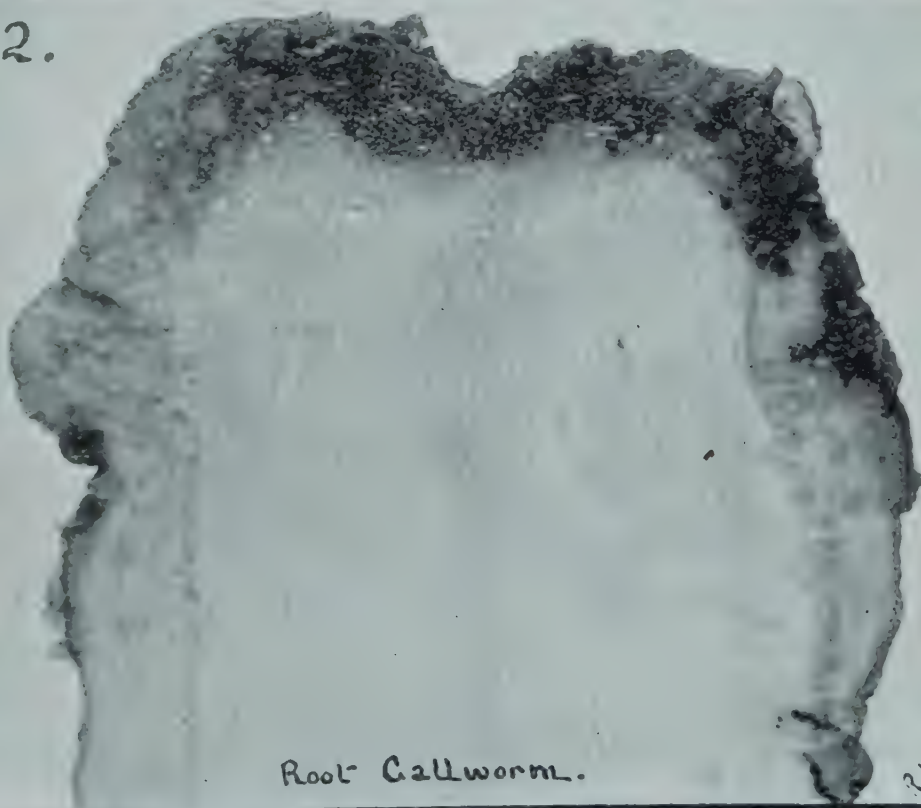
1.



Root Gallworm.

R.W.

2.



Root Gallworm.

R.W.





the same effect. This may be distinguished from all other discolorations of the internal tissues by the fact that the centre of the tuber is affected and the rest practically clean. Infectious troubles start in the region of the vascular bundles. There need be no hesitation in using tubers shewing brown smudge for seed purposes.

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There are several other diseases which may be present in seed potatoes. Thus the notorious "Irish Potato Blight" (*Phytophthora infestans*) causes a form of rot in the tubers, and is doubtless often present in consignments from overseas. Under Rhodesian conditions, however, this fungus seems never to develop. Close, muggy atmosphere is necessary for its welfare, and the air dries too rapidly after rains in this country to suit the blight. "Early Blight" (*Alternaria solani*) is stated to be perpetuated by fungus filaments present in the tubers, but the tubers are unaffected, and the presence of the disease cannot be detected. This fungus is, of course, exceedingly injurious in this Territory. The dreaded "Warty Disease" or "Black Scab" (*Chrysophlyctis endobiotica*) is not likely to be present on seed tubers, owing to the precautions taken to prevent its introduction into South Africa, where it is not known to occur, and the precautions taken to prevent its spread in Europe and the British Isles. It is characterised by blackish wart-like growths on the tubers and stems of the plants. An illustration of this disease appeared in the issue of this *Journal* for October, 1910.

The question is often asked whether it is safe to plant seed infested with "Potato Tuber Moth" (*Phthorimæa operculella*) without endangering the ensuing crop. If the land is kept in good tilth, there is no reason why the infestation of the seed should have any effect in this respect at all, and instances have come to notice where badly infested seed was planted and the ensuing crop was practically free. The moths need to emerge from the caterpillars in the infested tubers and lay eggs before a new brood can develop. The moths would be fortunate if they could make their way to the surface. If they fail to do this, they must perish in the soil. Having reached the surface, they may lay eggs on the tops or find their way by a crack to a growing tuber and infest it. It is the grower's

business to prevent this, by keeping the surface of the soil broken so that no cracks form. There is more danger to the crop from the moths breeding in volunteer tobacco or potato tops than in using infested seed, provided the crop is cared for to a reasonable extent.

There are two main rules to be observed in obtaining seed potatoes:—(1) If importing from overseas, buy from a well-known and reputable firm of seedsmen who are familiar with the South African trade. (2) If purchasing locally, arrange to purchase from a grower whose land is known to be free from disease and gallworm. If possible, personally inspect the crop that is to furnish the seed, whilst still in growth. Learn to recognise the main troubles, and act accordingly.

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(1) The recipe for *Formalin treatment* of seed potatoes is:—

Commercial formalin, 1 pint.

Water, 30 to 40 gallons.

The tubers are to be soaked in this preparation for two hours before planting.

(2) The recipe for the *Corrosive Sublimate treatment* is:—

Corrosive sublimate, 2 ozs.

Water, 16 gallons.

The tubers should be soaked for an hour and a half before planting. Certain precautions are necessary in handling this solution, which is of a caustic nature and, of course, highly poisonous. Wooden barrels must be used for the work, as the solution attacks metals.

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### EXPLANATION OF PLATES.

PLATE I.. Fig. 1. Potato tuber affected with Corky Scab (*Spongospora scabies*). Note the turning back of the skin to expose the mass of spore balls within.

Fig. 2. Sections of tubers affected with Bacterial Disease (*Bacillus solanacearum*). Note the brown ring in the region of the vascular bundles and the



1.



RWJ

Internal Disease, Sprain

Brown Fleck.

2.



RWJ

Brown Smudge.

3.



RWJ

Brown Smudge.



white masses of bacteria. A highly infectious disease, affecting the plants as well as the tubers. Illustration after McAlpine.

PLATE II. A scabby potato tuber. Scab of this nature may be due to a variety of causes (see text), and is not necessarily infectious, but may be so.

PLATE III., Fig. 1. A potato tuber bearing the sclerotia or resting forms of *Rhizoctonia* or Stem Rot. The black specks are very superficial and are usually easily scraped off, shewing the skin intact beneath. Under certain conditions, however, this disease may seriously damage the ensuing crop.

Fig. 2. A tuber affected with Dry or White Rot (*Fusarium solani*), shewing the spore-bearing fungus filaments in full growth. The disease is infectious, but almost always present amongst potatoes.

Fig. 3. The same disease, shewing the Dry Rot appearance. Note the shrivelling of the skin, due to the destruction of the tissues within.

PLATE IV., Fig. 1. Potato tuber shewing galls due to Root Gallworm (*Heterodera radicicola*). A very dangerous pest.

Fig. 2. Section of tuber heavily infested with Gallworm (slightly enlarged). Note the white specks in the tissue. These are the swollen female worms. Note also the decay that has set in as a result of the infestation.

PLATE V., Fig. 1. Section of tuber affected with "Internal Disease," "Sprain," or "Brown Fleck." This is a physiological trouble, and is not infectious.

Figs. 2 & 3. Sections of tubers shewing a defined brown smudge towards the centre. This appearance is produced by exposure to too great heat. The trouble is not infectious.



# Production of Pedigree Seed.

## MAIZE.

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By H. GODFREY MUNDY, F.L.S.,  
Government Agriculturist and Botanist.

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In no farming country in the world probably is the importance of good seed better realised than in Southern Rhodesia. The fact is exemplified in the care taken by the majority of farmers to plant only selected seed maize, and it is safe to say there is hardly a maize grower in the country who does not practise seed selection to a greater or lesser degree. In spite of this, season after season enquiries are received by the Department of Agriculture regarding reliable supplies of seed maize, and invariably many growers have to be content with what is nothing better than good commercial grain which has been sieved. It is evident, therefore, that a strong demand for good seed exists. Many of the leading maize growers have steadfastly followed their present methods of selection for the last five or six years, yet it is very doubtful whether during this period the general quality of the maize produced in the country or the yield per acre has undergone an improvement commensurate with the labour expended in selecting the seed. Such a statement may perhaps be questioned by some, and it demands some explanation. Elsewhere in this issue of the *Journal* the question of a pure seed supply for Rhodesia is dealt with, and it is suggested that to achieve this end, farmers should grow the highest grade of seed possible for their own use, and also perhaps for sale. The object of the present article is to indicate wherein existing methods of seed-maize selection are at fault, and how they may be improved upon. Subsequently, the improvement of other seed will be dealt with.

Seed selection is at present mainly confined to the maize

crop, and takes the form of picking out from the dump or crib the largest and most symmetrical ears which appear true to the type grown. These ears are tipped and butted, and are then used for seed by the grower, and also sold as selected seed maize. It would be of much interest to know in what percentage these good ears owe their excellence to external influences, rather than to hereditary characters. As often as not, probably the large ear owes its superiority to the fact that the parent plant grew upon an ant heap, or on a site where the stalks had been burnt the previous year, thus fertilising the soil. Or again, perhaps, the seeds dropped on either side of it failed to germinate, and the plant thus commanded a greater space for root development and nutrition. These are every-day conditions in a maize field, and given any one of them the character of excellence, owing its origin to external conditions, is not a reliable hereditary trait, and is, therefore, not usually transmitted to the offspring. The oft-repeated axiom that "like produces like" is only true with modifications. As an example of this, a grain of maize dropped in the rich soil of an old kraal may produce a plant with five or six stalks and a large fully developed ear on each stalk. We should not, however, expect seed taken from this plant and sown on ordinary land to produce plants with the same stooling propensity and prolificacy of yield. By this simple example it will be seen that the selection of large ears in the maize crib does not necessarily mean these good qualities will be transmitted to the resulting crop. Granted this to be the case, a certain proportion of the seed planted under the present system of selection will probably throw back to an original inferior type, and in the process of cross-fertilisation will act injuriously towards those plants which otherwise would breed true to the improved type. How can this be avoided, and how can seed selection be practised with the best results?

The reply depends upon the variety of crop; whether it is self-fertilised, as is generally the case with wheat, oats, rye and barley, or cross-fertilised, as in the case of maize. Maize being at present the most important Rhodesian crop, and the one with which there is the greatest demand for pure seed, will be first dealt with. As in breeding livestock, so in producing high-grade agricultural seed, the grower must be

fully acquainted with the breed characteristics, or, in other words, he must know the type for which he is aiming, and the relative good and bad traits likely to be encountered. A knowledge of the breed cannot be imparted on paper, and practical experience is the only sure guide.

Presuming the grower to have the requisite knowledge, his first step will be to secure the best seed of the particular variety available in the country. This can usually be done from other recognised growers of the breed, or from the Government Experiment Farms, or from local seed merchants. Sufficient of this seed should be secured to plant from five to ten acres, and this crop should be grown under entirely normal conditions of soil and treatment. As the resulting crop approaches maturity, or when the ears are in a semi-ripe stage, the grower should make a careful inspection of the field, and the best-developed plants carrying the most promising ears—having due regard to the fact that such plants are not unduly favoured in development by individual soil conditions—should be marked in such a way that they may be harvested separately. It may here be well to digress a moment to describe the characteristics of a desirable maize plant, some of which are as follows:—

(a) Strong, robust stalk, with well-developed roots. Thick below, tapering gradually, and not too tall.

(b) Good leaf development to promote the storing up of plant food. The number of leaves should not be less than 14 to 16 as a rule, and the blades should be broad, strong, and of a healthy green colour.

(c) Ears borne from 3 ft. to 4 ft. above ground level to facilitate easy harvesting and to obviate top-heaviness.

(d) Ears with reasonably long shanks—3 ins. to 5 ins.—and being well covered at the tip by the sheaths or husks. These two characters prevent injury to the grain by late rains or insects as the crop approaches maturity.

(e) Freedom from disease.

(f) Freedom from excessive suckering where this is not a breed characteristic.

(g) One or two—preferably one—large, well-developed ear.



About two to three hundred desirable plants should be thus marked in the field, and this can be done either by attaching to each a piece of "limbo," or more simply still by "topping" selected plants. The ears from plants thus marked are harvested separately when ripe, and, after being husked, are laid out for careful inspection. Of the two or three hundred ears thus obtained, 50 to 100 of those most closely approaching the ideal are finally selected, and after tipping and butting, the seed of each is carefully hand-shelled and placed in a separate packet, the packets being numbered from one onwards.

In the second season the grain from each package, representing the progeny of each individual ear, forms the seed for planting one row in the "ear to row" plot. The "ear to row" plot should be grown under the normal farm conditions, and should not be unduly forced by the use of fertilisers. The term "ear to row" plot simply indicates that each row in this seed plot has been sown with grain from the same ear. If this ear was pure, all the grains from it should breed true to the parent type, and thus perpetuate its good qualities. In actual practice, however, maize is subject to a certain amount of cross fertilisation between individuals, and thus all the ears will not breed true. Only those which do so, however, are of value to the breeder, hence the importance of the "ear to row" plot. Not more than 50 to 100 grains need be planted in each row, the remainder of the seed being reserved for future reference, and this planting can best be done with a hand-planter or dibbler. As the seed plot matures, it can easily be seen which of the rows give the best promise and are breeding true to type. Those which are obviously not doing so should be pulled out and discarded, if possible before they can shed pollen.

Selection should be made from the best plants in the best rows—four or five or even more of the best plants in each being taken and treated as in the previous year—namely, marked with "limbo" or "topped," and when mature harvested separately. As before, from the 100 to 200 ears thus obtained, 50 to 100 of the best will be finally selected. It is at this stage that the samples of grain retained from the previous year become of value for reference purposes. Thus, for example, from row No. 14 three ears are selected. The grain from these

can then be compared with the parent grain No. 14, and an estimate of the extent of improvement can be arrived at.

It may here be mentioned that cross-fertilisation is essential to the health and vigour of the maize plant, and to artificially induce self-pollination will tend towards sterility. The breeder, therefore, must realise that a certain amount of cross fertilisation is necessary, and where this is permitted to take place only between desirable parent plants and seed from these only is saved for use in the "ear to row" plot, no harm will be done.

After tipping and butting, the grain of each ear will be hand-shelled and again placed in separate bags and numbered for sowing the "ear to row" plot of the following season. The more scientific breeder will keep a record and compare the relative weights of the ears, the length of the kernels, the percentage of grain to cob, and the various other points upon which emphasis is laid in the maize judging score card. For the practical breeder with a good knowledge of the variety he is growing, experience is sufficient guide, and he will quickly discern when the improvement he aims at is being obtained and when not.

The remainder of the ears from the best rows in the "ear to row" plot, which will still be superior to the average seed of the farm, is harvested in the ordinary manner, and the good ears are tipped, butted, shelled and bagged for sowing the "increase" plot the next year. The "increase" plot provides the pedigree selected seed for bulk sowing on the farm and for sale. In order to secure as large a yield as possible from the "increase" plot, this may be given all possible advantages by the use of fertiliser and any other means which may commend itself.

The above is the approved method of producing pedigree selected seed maize. It entails: (1) an acre breeding plot, known as the "ear to row" plot; and (2) an "increase" plot, which may be of any suitable size from five acres upwards. The former must be isolated from all other maize, and can often be situated with advantage in the orchard or kitchen garden. The latter also is better situated not less than 400 yards from any other maize, unless protected by a shelter belt



of timber, but, failing this, it may be planted to windward, and somewhat earlier or later than the bulk sowing of the farm. By means of the two breeding plots here described, a recurring system of improvement by selection can be introduced, and one which at the close of each season will carry the grower nearer and nearer to his ideal. Nor can any limit at present be placed on the degree of improvement obtainable by selection. In the United States of America it has been estimated that pedigree selected seed will give an increase of three bags per acre over ordinary unselected seed. At the Botanical Experiment Station last season on land worked under rotation of crop for four years, but which had never received manure of any kind, the yield of grain from the "ear to row" plot—the result of four years' selection—was 18 bags (200 lbs. each) per acre. Without rotation of crop, and with ordinary commercial seed, this land would not at the most yield more than 10 to 12 bags per acre.

The point will not be unduly laboured if it is repeated that existing methods of selection from the maize dump fail in their object, since they do not shew whether or not the good qualities apparent in any particular ear will be transmitted to the off-spring. With the "ear to row" plot, selection is not made until the parent ear has proved its ability to transmit the good qualities to the second generation; while, further, the improvement becomes continued, and can as yet have no limit placed upon it.

No farmer who claims to be devoting attention to the growing of pure seed maize should shirk the small additional trouble incurred by the "ear to row" plot. The small amount of work entailed can well be done in the early morning or late evening as other calls permit, and to the keen and intelligent breeder the selection plots will prove such a source of interest and recreation as to readily make amends for any little additional attention they may require. Apart, however, from their not inconsiderable personal interest, the breeding plots, if properly conducted, will prove a direct source of income to the farmer, not only by increasing his acre yields, but by building up his reputation as a grower of reliable seed, and so enabling him to secure a much higher price for his seed grain.

*(To be continued.)*



## Rhodesian Citrus Fruit.

### VALENCIA LATE ORANGES IN THE LONDON MARKET.

By CHARLES E. FARMER,  
Citrus Adviser to the B.S.A. Company.

A consignment of 17 boxes of this variety of orange was sent from the Premier Estate, Old Umtali, *via* Beira and Durban, leaving Beira on 20th August. Fifteen boxes were sent to Messrs. C. Joseph & Co., 49, St. Mary Axe, of which 14 were sold on 6th October.

The account sales are as follows:—

|           |                       |      |     |          |    |   |
|-----------|-----------------------|------|-----|----------|----|---|
| Val. Late | 150—2 cases oranges,  | 14/6 | ... | £1       | 9  | 0 |
|           | 176—4 do.             | 16/- | ... | 3        | 4  | 0 |
|           | 200—5 do.             | 16/- | ... | 4        | 0  | 0 |
|           | 1 lost in re-packing. |      |     |          |    |   |
|           | 252—2 cases oranges,  | 14/- | ... | 1        | 8  | 0 |
|           | 126—1 do.             | 13/6 | ... | 0        | 13 | 6 |
|           |                       |      |     | £10 14 6 |    |   |

Messrs. Joseph & Co. make the following report on this consignment:—

“The fruit is good, although the skin is a little rough in comparison with the best varieties that are grown in Cape Colony, but, of course, the sample is a late variety.

“As regards oranges in this market at this time of the year, until the last two seasons the only oranges the public had an opportunity of consuming came from Jamaica; but there can be no question that those which are now grown in South Africa are of better quality, and sweeter, and contain more juice, and are in every way superior to the Jamaica sorts.

“That the South African orange is going to stay is a recognised fact, and this trade is capable of great extension, as the orange in this country is looked upon with great favour, and there is a demand for it all the year round, this being a fruit which the public never tires of.

“Particular attention should be paid to the packing, and it is absolutely necessary for the oranges to be packed tightly in the boxes, so as to do away with all possibility of movement. Provided the fruit is sent in ventilated hold, there is no doubt that a good business can be built up.”

It was unfortunately again compulsory to use the same kind of orange box for this shipment as was used for the earlier consignments, of which a report was published in the December issue of this *Journal*, that is, very fragile, unsightly boxes made of wattle wood. In a letter sent with the foregoing report, Messrs. Joseph & Co. make this comment, “The cases had a very dirty appearance. The fruit was wasty, and most of the cases were plundered; in fact, we had to repack the entire 15 cases, thereby losing one case, which is shewn on the account sales.”

In comparing these prices with those reported in the December issue of the *Journal*, it will be noticed that the fruit arriving in London in July realised more money. After reading what the brokers say of the South African orange as compared with the Jamaica fruit—its competitor at this time of year—I think these lower prices are due more to the smaller size of the Valencia Lates, the English market always shewing a preference for large oranges, and to the condition of the packages on arrival. If “most of the cases had been plundered,” it follows that the slats of the boxes must have been broken, and the removal of one or more fruits would throw the whole box loose, and the remainder would become more or less bruised. I am more inclined to this belief, because as a matter of fact the fruit in this consignment had thoroughly ripened on the tree before it was picked, and when it left the estate was much sweeter and more palatable than that in the previous consignments, which, owing to the lateness of the season of 1913 for oranges, was picked and packed in an unripe condition.

Arrangements are being made for the importation of sufficient boxes of a more suitable kind for any consignments which are likely to be sent to London next season.

# The Cabbage Web-Worm.

A PEST OF CABBAGE AND ALLIED PLANTS.

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By RUPERT W. JACK, F.E.S., Government Entomologist.

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Those who undertake the task of growing cabbages, turnips and allied crops in Southern Rhodesia will certainly make the acquaintance of a variety of insect pests. The little moth to which the name of Cabbage Web-Worm is given is one of the enemies that are liable to put in an appearance, and a number of complaints concerning its ravages have been received from time to time. The life history and habits of the insect have now been followed in detail at the Agricultural Laboratories, and will be considered in the following pages. Remedial measures will be given at the end of the article.

The injury due to this insect is sufficiently characteristic to remove all doubt as to the identity of the author. The plant is found to be attacked at the heart, especially about the bases of the sprouting leaves. An examination reveals the presence of web, to which particles of excrement adhere. On removing this web, the whitish caterpillar is often to be seen, but sometimes a hole is all that is visible. On cutting the stem apart with a knife, however, the caterpillar is revealed inside the tissues of the plant. The latter is especially liable to occur in the case of such plants as turnips, kohlrabi, etc., which have swollen crowns. In young plants of cabbage, kale, etc., the caterpillar commonly forms a groove down the side of the stem. This is covered with the usual web and excrement, beneath which the insect feeds. The caterpillar, when full grown, does not exceed about half-an-inch in length (see plate).

There is hardly room for doubt that the insect is the same as that which, in the United States of America, is called the



“imported cabbage web-worm” (*Hellula undalis*, Fab.). The designation “imported” is dropped in this article, because there is no reason to believe that it is applicable, although the wild food plants of the insect have not yet come to light. The pest is known to be common in the Mediterranean basin, and it is highly improbable that any plants capable of serving as food plants of the insect have been imported in a growing condition from that part into Southern Rhodesia. Further south in the Union, this species has never been reported as injurious, or at least nothing has been published concerning it. Probably, therefore, it ranges from the Mediterranean to this Territory as an indigenous species, and may extend further south, but not in sufficient numbers to constitute a pest. As the insect seems to be susceptible to even light frosts, it is probably confined by this natural limitation to those parts of the continent where the mean temperature is relatively high.

The following is a description of the egg:—Broadly oval, but somewhat irregular in outline; surface glossy and irregularly reticulate, the pits being very shallow (see Fig. 4); colour, creamy white, shewing blotches of pale pink after first day; dimensions, about .53 m.m. by .35 m.m. The eggs are deposited singly, usually between the base of the petiole of a leaf and the stem, but any crevice may be selected. In confinement, the eggs were deposited freely amongst the fibres where the stem had been broken off and in leaf scars on the stems. The eggs hatch in from three to four days in the summer.

The newly hatched larvæ measure from 1 to 1.2 m.m. in length, are pale pinkish yellow in colour, the head and thorax being brownish black, and the legs clear. They are sparsely ornamented with long hairs. Feeding is at first superficial, but the larvæ seek crevices, and do not feed exposed on the leaf. A few days after hatching, thin web is noticeable, with excrement adhering to it, but at first it serves rather as a foothold than as a protection. Later, the caterpillars feed exclusively beneath the shelter of the web, which, with the adherent droppings, completely hides them. Feeding is confined to a small radius, and in this way excavations are formed in the stem and heart of the plant. These are frequently shallow, but at times, when attacking such plants as turnip and kohlrabi, the insect tunnels the swollen tissues through and through

(see plate). The tunnels generally start from the crown, but in July it was found that the bulk of the plants (kohl-rabi) containing living larvæ in the field were attacked from beneath, whilst a number that had started feeding from the crown were dead from no obvious cause. The inference is that the light frosts which occur at that season of the year are inimical to the insect, and that instinct impelled either the parent moth or the larva to seek the shelter of the swollen stem. Certainly there was no similar infestation from below during the warmer months, and there was no shortage of food, which might have induced the caterpillars to migrate from other plants and attack the first plant encountered at the nearest point.

Under cage conditions the larvæ were full fed from 24 days after hatching. At this stage they measure about 13 m.m. in length (very roughly half-an-inch). The general impression of the colour is creamy, but a closer inspection reveals several faint brown, longitudinal stripes, as shewn at Fig. 5. In addition, the lens reveals a few short hairs on each segment, each borne on a small dark tubercle. The head is brown, and the thoracic shield creamy, with a few dark brown dots and markings, as shewn in the figure. The larva pupates within a loose cocoon, to which any loose surrounding substance adheres. On the plant this consists of the excrement, but pupation frequently takes place on the earth, in which case the particles of soil cover the surface of the cocoons (see Fig. 7).

The pupæ or chrysalides vary considerably in size, from 7 to 10 m.m. representing approximately the range in length. The colour is pale yellowish brown. An enlarged figure of the pupa is shewn at Fig. 6 in the plate. The cocoons are very irregular in shape, and vary as much as from 15 to 25 m.m. in length. In the laboratory in June the pupal stage lasted 14 days, making a life cycle of 40 days, but in the summer the duration is shorter.

The adult moth is a pretty little insect, giving the impression of a creamy ground colour, marbled with greenish brown. The wings, however, vary somewhat both in colour and markings. The wings expand from 17 to 20 m.m., or averaging roughly about seven-tenths of an inch. An enlarged photo-



graph of the moth is reproduced at Fig. 1 in the plate, the same insect at natural size being shewn at Fig. 2. In the resting position the wings are not folded, but held flat, the fore wings covering the hind wings, and coming into contact with the body at their lower margins, producing the shape of a broad wedge. The moths are nocturnal in habit, but are easily disturbed from an infested field at almost any time throughout the season. They allow themselves to be carried down wind, and quickly alight again, usually on the surface of the soil. If undisturbed, they soon seek the shelter of a plant again.

The different broods overlap greatly, all stages being found throughout the growing season and during the greater part of the winter wherever food is available. Under such circumstances they continue to breed without noticeable pause, except that the duration of the different stages is extended. There is no sign of any special provision for passing the season of dearth, from July to October. Caterpillars collected about the middle of May produced moths from the middle of June to the end of the first week in July, at which time the moths were also quite abundant in the field, continuing so until the end of the month. Caterpillars collected during the last week in July produced moths from the second week in September until the second week in October. The same rate of increase could hardly hold in nature on account of the lack of growing plants between July and September, except in situations where the soil is naturally moist. Lack of food at this time is probably an important check on the increase of the insect, which is but little attacked by parasites. In all the rearings carried out at the laboratory, only four parasites (*Bracónidæ*) emerged in the cages, and there is even an element of doubt as to whether these were from the web-worm or from certain caterpillars of the Diamond Back Moth (*Plutella sp.*), which were also present. The cultivation of cruciferous vegetables all the year round under irrigation certainly gives the pest an opportunity of increasing far more rapidly than it could under natural conditions, and this is one of the many similar instances in which agricultural practice is directly responsible for the conversion of a native insect into a pest. Damage from web-worm can be expected at any time during the growing season, but most complaints reach the office concerning its presence



on irrigated crops in November. At this time an irrigated crop makes an oasis of succulent food in the midst of the dry veld, and native insects are liable to be attracted to it in numbers. Such crops, therefore, call for special care in connection with pests.

As in dealing with all insect pests, remedial measures will prove more effective in proportion to the promptness of their application. Plants of the cabbage family are so liable to attack from leaf-eating insects, that it undoubtedly pays to spray or dust them as a preventive measure without waiting for obvious signs of damage. If this be done, injury from the web-worm will, to a large extent, be avoided. Preventive treatment has special value in connection with this pest, because, from its habit of attacking the heart of the plant, injury when noticed is likely to have attained serious proportions, the plant being altogether crippled, whereas with insects which attack the outer foliage, the damage is obvious before the plant is seriously injured. Any of the arsenical preparations may be used as a spray, namely, arsenite of lime, arsenate of lead, or Paris green. On plants such as cabbage, cauliflower, etc., with slippery leaves, a "sticker" should be added to the poison to secure greater adherence. Where water is a consideration, Paris green may be applied dry by mixing it with flour or lime and dusting it on to the plants by shaking it over them from a piece of sacking tied up to form a bag. This should be done when the plants are wet from rain or dew. In general, however, this method is not as satisfactory as spraying. Directions for preparing these poisons are given at the end of this article. Many people are prejudiced against spraying edible foliage with arsenical poisons, but there is no need for fear on this account, for it has been definitely proved that even in the most careless hands it is practically impossible to obtain a poisonous dose of arsenic from eating sprayed vegetables. The plants only need spraying when young, and by the time they have arrived at maturity, practically all trace of the arsenic will have vanished. Spraying should be commenced when the plants are still in the seed beds, and repeated as new growth is put forth after planting out. The foliage should be kept well covered until the plants are about half grown, when spraying may be discontinued.

In addition to spraying, however, the following preventive measure should be adopted, namely, the destruction by

fire of all plants as soon as their period of usefulness is past. Such plants serve merely as breeding grounds for insect pests, and should not be tolerated by the careful grower. In addition to web-worms, old cabbage stumps, etc., help to perpetuate such insects as Turnip Sawfly (*Athalia rosea*), Bagrada Bug (*Bagrada hilaris*), Diamond Back Moth (*Plutella sp.*), and Cabbage Aphis (*Aphis brassicae*), all of which are very destructive enemies of plants of this family in Southern Rhodesia.

The arsenical preparations referred to above should be used in the following proportions:—

- (1) Arsenate of lead (paste), 3 lbs.  
Water, 50 gallons.
- (2) Paris green, 1 lb.  
Fresh lime (quick or water-slaked), 2 lbs.  
Water, 160 gallons.
- (3) Arsenite of lime—  
Arsenite of soda,  $\frac{1}{4}$  lb.  
Fresh lime (quick or water-slaked), 2 lbs.  
Water, 50 gallons.

The arsenite of soda should be dissolved in a little hot water and made up to 25 gallons in one cask. The lime, after slaking if necessary, should be mixed with 25 gallons water in a second cask. When the contents of the two casks are mixed and stirred, the preparation is ready for use. This is by far the cheapest arsenical spray.

Liquids containing ordinary lime should be strained through coarse muslin to remove particles of grit, which are liable to clog the nozzles and induce undue wear on the spray pumps.

- (4) For dusting, use Paris green 1 lb., flour or lime 20 lbs., thoroughly mixed together.

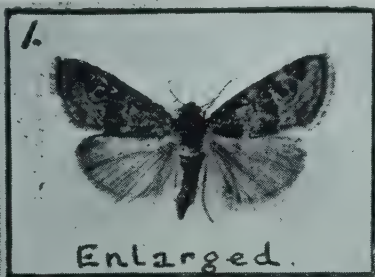
Resin “sticker”—

- Resin, 4 lbs.  
Carbonate of soda crystals (washing soda), 2 lbs.  
Water, 1 gallon.

This preparation is to be boiled until a clear solution is obtained. The process is facilitated by powdering the resin and adding slowly to a boiling soda solution, stirring meanwhile. This sticker is to be used in conjunction with the arsenical compound on such plants as cabbage, cauliflower, kohl-rabi and kale. The above quantity can be mixed with 50 gallons of spraying liquid. It is most effective in connection with preparations containing lime.



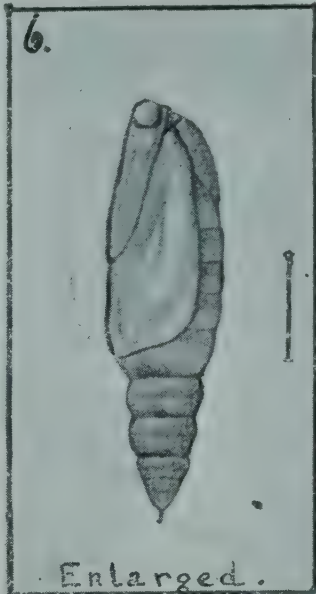




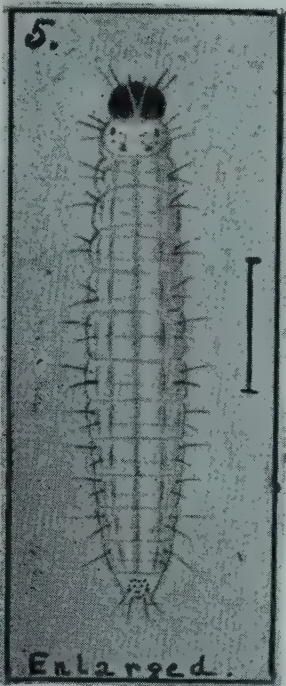
Moth.



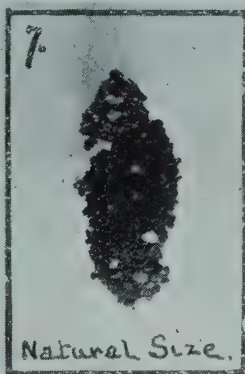
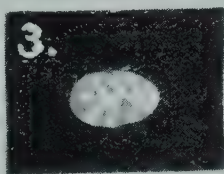
Moth



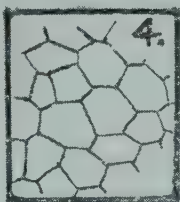
Pupa.



Larva.



Cocoon.



## EXPLANATION OF PLATE.

- Fig. 1. Adult moth, enlarged.
- „ 2. Adult moth, natural size.
- „ 3. Egg two days old, shewing pink mottling. Greatly enlarged.
- „ 4. Irregular reticulations on egg shell, formed by slightly raised ridges. Visible only under high power of microscope.
- „ 5. Larva—enlarged drawing. Actual length shewn by hair line adjacent.
- „ 6. Pupa—enlarged drawing. Actual length shewn by hair line adjacent.
- „ 7. Cocoon formed on surface of soil, shewing particles of soil adhering to silk. All cocoons are not formed in this situation, and larval excrement generally takes the place of the earth particles shewn in the figure.
- „ 8. Section of young turnip plant attacked and tunnelled through and through by the larvæ. Note that the primary point of attack was in the region of the heart.
- „ 9. Section of young kohl-rabi plant attacked at the heart, which has been destroyed, a shallow depression being excavated in the swollen stem.





# Poultry Keeping in Southern Rhodesia.

(CONTINUED.)

By C. C. GIRDLESTONE.

## FOODS AND FEEDING.

The feeding of poultry in Southern Rhodesia entails a drastic re-adjustment of ideas gained by experience in other countries, and it is in this, the most important item of successful poultry management, that we have most to learn.

In England, America, and our sister Colonies, including the provinces of the Union, certain foods, which both by experience and scientific experiment have become recognised as the most suitable diet, can be fed to poultry with profit, because of the cheapness of their production. On the other hand, many of these foodstuffs are too costly in Rhodesia to permit of their use as a staple ration.

The following table will exemplify this, and may prove instructive to some intending poultry-keepers:—

### COMPARATIVE PRICES OF FOODSTUFFS.

(All at per 200 lbs.)

|                   | England | Union of South<br>Africa<br>(Johannesburg) | Southern<br>Rhodesia<br>(Salisbury) |
|-------------------|---------|--|-------------------------------------|
| Wheat ...         | 17/-    | 21/-                                       | 31/6                                |
| Wheat Bran        | 11/6    | 12/6                                       | 35/-                                |
| Sharps or Pollard | 13/6    | ..   | ...                                 |
| Oats ... ..       | 18/-    | 12/-*                                      | 43/-*                               |
| Barley ... ..     | 16/-    | 14/6                                       | 40/-                                |
| Maize ... ..      | 15/-    | 10/-                                       | 10/6                                |

\* The food value of English oats is nearly double that of South African at the above prices.

There are no statistics available to indicate whether or not birds of good laying strains, developed and reared elsewhere to that end, maintain in Rhodesia the full productive powers their breeders claim for them. Therefore, in the absence of authenticated data bearing on this point, it is advisable to anticipate, even from stock reputed to be from celebrated laying strains, a moderate egg yield only. The writer's experience may not be typical, but it is that a yield of 100 eggs per bird per annum is a fair average to expect from a flock of well-bred hens.

On this basis, it obviously will not pay to feed to poultry imported foods such as oats, barley, wheat, sharps, or bran. They are without doubt the best of all cereals for the purpose, but the use of any or all of them can hardly be expected to enhance the egg-yield to a sufficient extent to compensate for the high cost per bird such a procedure would entail. Therefore they, and their products, must be considered beyond the pale of practical poultry economics until they are grown locally in sufficient quantities to bring their price within reasonable limits.

There are, however, several varieties of grain produced locally, generally obtainable at a moderate price, which are suited to poultry in a greater or lesser degree, and these, as far as possible, must be adapted to form the bulk of our poultry ration. The most suitable of them are:—Buckwheat, munga, sunflower seed, kafir corn, and maize, and the order in which they are named corresponds to their respective merits.

Tables shewing the chemical analyses and food ratios of these grains are given (with varying accuracy) in most poultry text books, and so perhaps the following comments upon their individual worth may be of more assistance than tabulated figures to those who have not yet found by practical experience an economical and suitable ration.

*Buckwheat* is a grain well suited to the climate, palatable, nourishing, and by reason of its small percentage of fat, an excellent corrective when maize or other fatty foods have been too largely fed. With advantage it may form the bulk of the food, either with other grains as a mixture, or fed separately. At present there is a difficulty in obtaining regular supplies, the output being small, and prices vary from 15s. to 27s. 6d.



per 200 lb. bag. It is, however, an easy and quick-maturing crop, a fair yield being 10 bags to the acre, and supplies are likely to increase as the demand becomes greater.

*Munga or Inyouti.*—This is undoubtedly preferable to either maize or kafir corn, with a better nutritive content. Adult birds thrive well on it when mixed with other grain, and its smallness is an advantage when fed in chaff or litter, in that a great amount of exercise is involved in searching for it. Its use as a poultry food is probably confined to South Africa, and although, from the writer's experience, it appears to be a fairly useful food, exhaustive tests are needed before its value over an extended period can be accurately assessed.

*Sunflower Seed.*—Recognised to be one of the most useful accessories to a grain diet. It is extremely rich in flesh-forming constituents, but its oiliness and consequent tendency to fat formation debars its use except in small quantities as an addition to other grains. In conjunction with buckwheat, munga, wheat or oats, it can be used in the proportion of one in six with one feed per diem, and in larger quantities at the end of a moult, when it is especially valuable in stimulating the new growth of feathers.

*Kafir Corn.*—Preferable in some respects to maize, being less heating and productive of unhealthy fat, but far from an ideal food, and synonymous with low egg yields and unprofitable stock.

*Maize.*—For Rhodesia, maize is the least suited to poultry of the locally produced grains mentioned, and the fact that it generally forms the bulk of their food doubtless has much to do with the numerous failures and unsatisfactory results. It may be fed in moderation without much apparent harm in the winter months, but only at that time, and as an addition to some less fattening grain or mixture.

This sweeping condemnation of the cheapest grain, and one so readily obtained at all seasons, is not made without good grounds, nor is it in any way opposed to its advocacy on the part of expert and lay writers in other countries. It is recommended by many of the best authorities in England and America, and largely used there with good results, but here the climatic conditions are so vastly different as to render inapplicable their recommendations.

Maize is the best ration for sitting hens, and this fact alone, to an observant poultryman, will sufficiently condemn its general use in a warm climate such as ours. Though less objectionable crushed than whole, in either case it is slow of assimilation, its consequent effect being to lessen the inclination to take exercise, without which fowls rapidly assume useless fat and unhealthy flesh, with resultant liver and ovarian disorders.

None of the grains recommended can be fed without variation for any length of time. Poultry, no less than other stock, require variety to whet their appetite and to keep them in health. The following are economical *menus*, with as much variation as the limited kinds of grain at our disposal permit:—

*Winter Months.*—Morning feed:—(1) 2 parts buckwheat, 2 parts munga, 1 part kafir corn,  $\frac{1}{2}$  part sunflower seed; (2) 2 parts buckwheat, 1 part kafir corn; (3) 2 parts munga, 1 part kafir corn; (4) buckwheat boiled for  $1\frac{1}{2}$  hours, dried off with a small quantity of bran or mealie meal, and fed while hot. Evening feed:—As morning feeds (1), (2) and (3), with crushed mealies in moderation.

*Summer Months.*—Discard maize altogether; in other respects feed as in winter.

*Quantity to Feed.*—A fair basis to work on is one handful (held downwards) per adult bird, morning and evening. If measured in this manner once into a convenient receptacle, this may be utilised as a measure, and so avoid the tedium of subsequently apportioning a quantity separately to each bird. An ordinary 1 lb. tea tin will serve the purpose, and will contain approximately 2 lbs. of grain, or a half-daily ration for 18 full-grown birds.

It is advisable to err on the side of under-feeding rather than over-feeding. There is nothing easier than to put flesh and condition on to birds that have been on short commons, but immediately their tissues have become burdened with fat from excess food, ailments develop, and before normal condition can be recovered by careful dieting, many deaths may result.

There are other constituents required in addition to grain in order to form a complete poultry ration, the principal being meat, bone, grit, lime and green food.

*Meat.*—House scraps or butchers' offal, such as ox-lung, well cooked and finely chopped, may be fed with good results once or twice a week. On farms or large plots, however, where extensive enclosures can be reserved for poultry, the natural meat ration in the form of insect life needs no augmentation.

*Bone.*—Green bones (bones as they are severed from uncooked flesh) are of great value as a stimulant to egg production. Bones in any other condition, no matter how dry and old, provided they are wholesome, will amply repay the trouble of collecting and crushing. Not only is the lime of which they are largely composed beneficial in formation of egg shell, but they are also of much assistance in digesting other foods as they themselves undergo the process of assimilation.

*Grit.*—Except on sandy soils, which generally contain a sufficiency, some form of sharp grit or coarse sand must be supplied freely. It is not essential to a fowl's existence, but without it much food is voided in a partially digested state, to the detriment of health and egg returns.

*Lime.*—An insufficiency of this will result in loss of vigour, and in thin-shelled or shell-less eggs. It is best given in the form of crushed bones or oyster shell.

*Green Food.*—The value of green food for poultry at all times and seasons cannot be over-estimated, and no pains must be spared to ensure a constant and plentiful supply throughout the year. In addition to its feeding value, it is an aid in digesting hard grains, has a cleansing and purifying effect upon the crop and intestines, and renders unnecessary the too frequent use of purging medicines.

Lucerne is better than all other succulent growths, but it is so little grown here at present that its recommendation seems futile. Failing a plentiful supply of green grass, then lettuce, cabbage, rape, oats or barley must be grown, even at the trouble and expense of much water carrying, if success is aimed at.

It may not be common knowledge that the much-abused weed common to so many parts, and generally known as "Blackjack," forms an excellent green food for poultry. Young chickens in particular consume it with avidity and thrive well on it.



## Weather Forecasting.

(CONTINUED.)

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By SIDNEY F. SIMMS, F.R.Met.Soc.

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We have now examined briefly the nature of barometric fluctuations, and it remains to consider the process by which rain is formed and precipitated. One of the first effects of temperature is to set in motion the forces of evaporation. When the sun rises and "gains heat," mists are dissipated, frosts thawed, and dews, etc., are evaporated. This evaporation takes place from any free water surface, that is, a surface of water which is free at any time to change its condition, either from solid to liquid or *vice versa*, and varies with the temperature and humidity. The process is briefly this: The impact of the sun's light on the water surface causes small corpuscles of moisture to rise into the air in an invisible state, known then as aqueous vapour. This vapour is suspended in the interstices between the atoms of oxygen and nitrogen of which the air is made up, and as the temperature increases, the air expands, the interstices widen and more vapour is taken up until the air becomes saturated. The capacity of the atmosphere to hold this moisture varies with the temperature. When the temperature is 32 degrees F. the air can sustain up to one one-hundred and sixtieth of its own weight, and this capacity is doubled for every 27 degrees F. increase of temperature. At 32 degrees F., when the air is saturated, each cubic foot contains 2.37 grains of moisture, at 60 degrees the content is 5.87 grains, and at 80 degrees it is 10.81 grains. Then if the air at 80 degrees were suddenly cooled to 60 degrees, it would obviously contain 4.95 grains per cubic foot in excess of its capacity. This excess would then immediately condense and be precipitated either as rain, hail, snow, etc.

Sir John Moore has laid it down that the vapour content of the atmosphere, considered singly, exercises a more profound and far-reaching effect upon the weather than any other element. It is certainly responsible to a great extent for all the various forms of precipitation, and for this reason it behoves us to consider the matter carefully. The percentage of saturation of the atmosphere is measured by the hygrometer, and when so measured is called the relative humidity. The principle of the hygrometer is briefly this: Two ordinary mercurial thermometers are suspended on a frame, the bulb of the one—the dry bulb—being exposed to the air, while that of the other—the wet bulb—is covered with a piece of muslin, with a few strands of lamp wick or floss silk running from the muslin to a small reservoir of water at the bottom of the frame. Water is passed up the wick to the muslin by capillary attraction, and from there is evaporated off by the surrounding air. The temperature indicated by the wet bulb falls in proportion to the amount of rapidity of evaporation. From the readings of these thermometers, and by the aid of specially constructed tables, the relative humidity, the dew point, or temperature at which dew will be deposited, the tension of the aqueous vapour and other interesting calculations may be made. But it is the relative humidity and dew point which have the greatest bearing on our subject now, and we will, therefore, consider how these factors influence our weather. We have already seen how the vapour content varies with the temperature, how saturation of the air is brought about, and how this moisture is eventually precipitated, that is, by a sudden cooling of the atmosphere, and it now remains to consider briefly what relation the dew point has to our weather. Dr. Buchan has found \* that “the dew point determines the minimum temperature of the night.” Suppose the dry bulb temperature to be 56 degrees and the wet bulb 48 degrees, from our tables we find that the dew point is 40.4 degrees. During the night, should the temperature fall as far as this point, dew is deposited. Immediately the dew is condensed out of the atmosphere, the latent heat is freed, and this causes the temperature to rise. Later on, the air is again cooled by radiation from the earth’s surface, and the temperature again descends

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\* “Introductory Text Book on Meteorology.”

to the dew point, when the same process is repeated. Thus the temperature is constantly oscillating backwards and forwards throughout the night, provided the air remains comparatively calm and the sky cloudless.

Now let us suppose the temperature of the dry bulb to be 48 degrees and the wet bulb 41 degrees. We find on reference to our tables that the dew point is 29.1 degrees. This temperature is below the freezing point, so that when the dew is deposited it immediately freezes, and the result is frost in any of its several forms. It will readily be seen how important is the dew point, and how necessary it is that we should be in a position to anticipate its effect on our temperature. The formation of dew is interrupted in several ways. As the sun "sinks" below the horizon, solar radiation diminishes and finally ceases. Simultaneously, however, another kind of radiation increases, that is radiation from the rapidly cooling surface of the earth or terrestrial radiation. If the sky is clear, this radiation increases, but should clouds form, or a breeze spring up, or should the air be damp, radiation is interfered with or suspended, because the clouds constantly radiate the heat back again to the earth, while a damp atmosphere acts as a screen between the earth and sky, and so checks the action of radiation.

We have considered the various indications which we may expect from our instruments, and may now pass to a study of the non-instrumental phenomena and see how the formation of different types of clouds, direction and force of wind, halos, haze, coronas, etc., affect our weather.

Various cloud forms and combinations are commonly observed in these latitudes, and the following is a brief description by which they may be recognised:—

1. CIRRUS (Cl.).—*Detached clouds, delicate and fibrous looking, taking the form of feathers, generally of a white colour, sometimes arranged in belts which cross a portion of the sky in "great circles," and by an effect of perspective, converge towards one or two opposite points of the horizon.*

2. CIRRO-STRATUS (Cl.-S.).—*A thin, whitish sheet, at times completely covering the sky, and only giving it a whitish*



appearance, or at others presenting, more or less distinctly, a formation like a tangled web. This sheet often produces halos around the sun and moon.

3. CIRRO-CUMULUS (Ci.-Cu.).—*Small globular masses or white flakes without shadows, or having very light shadows, arranged in groups and often in lines.*

4. ALTO-CUMULUS (A.-Cu.).—*Largish globular masses, white or greyish, partially shaded, arranged in groups or lines, and often so closely packed that their edges appear confused.* The detached masses are generally larger and more compact.

5. ALTO-STRATUS (A.-S.).—*A thick sheet of a grey or bluish colour, shewing a brilliant patch in the neighbourhood of the sun or moon, and which, without causing halos, may give rise to coronæ.* This form goes through all the changes like the Cirro-Stratus.

6. STRATO-CUMULUS (S.-Cu.).—*Large globular masses or rolls of dark cloud, frequently covering the whole sky, especially in winter, and occasionally giving it a wavy appearance.* The layer of Strato-Cumulus is not, as a rule, very thick, and patches of blue sky are often visible through the intervening spaces. All sorts of transitions between this form and the Alto-Cumulus are noticeable. It may be distinguished from "*Nimbus*" by its globular or rolled appearance, and also because it does not bring rain.

7. NIMBUS (N.), RAIN CLOUD.—*A thick layer of dark clouds, without shape and with ragged edges, from which continued rain or snow generally falls.* Through the openings in these clouds an upper layer of "*Cirro-Stratus*" or "*Alto-Stratus*" may almost invariably be seen. If the layer of "*Nimbus*" separates up into shreds, or if small loose clouds are visible floating at a low level, underneath a large "*Nimbus*," they may be described as *Fracto-Nimbus*. ("Scud" of sailors).

8. CUMULUS (Cu.) (WOOL-PACK CLOUDS).—*Thick clouds, of which the upper surface is dome-shaped and exhibits protuberances, while the base is horizontal.* When the cloud is opposite the sun the surfaces usually presented to the observer have a greater brilliance than the margins of these protuber-

ances. When the light falls aslant, these clouds give deep shadows; when, on the contrary, these clouds are on the same side as the sun, they appear dark, with bright edges.

9. CUMULO-NIMBUS (Cu.-N.), THE THUNDER OR SHOWER CLOUD.—*Heavy masses of clouds, rising in the form of mountains, turrets or anvils, generally having a sheet or screen of fibrous appearance above ("false Cirrus"), and underneath a mass of cloud similar to "Nimbus."* From the base there usually fall local showers of rain or of snow (occasionally hail or soft hail). Sometimes the upper edges have the compact form of Cumulus, forming into massive peaks round which the delicate "false Cirrus" floats, and sometimes the edges themselves separate into a fringe of filaments similar to that of the Cirrus cloud. This last form is particularly common in spring showers.

The front of thunder-clouds of wide extent frequently presents the form of a large bow spread over a portion of the sky, which is uniformly brighter in colour.

10. STRATUS (S.).—*A horizontal sheet of lifted fog.* When this sheet is broken up into irregular shreds by the wind, or by the summits of mountains, it may be distinguished by the name of *Fracto-Stratus*.

It is generally believed that the upper clouds, *e.g.*, cirrus, cirro-cumulus and cirro-stratus, are composed of ice crystals. These are the types which produce halos and coronæ around the sun or moon, and halos are nothing more than light refracted through ice crystals. Cirrus clouds invariably precede a cyclonic system, being carried aloft by the overflow of air in front of the cyclone, and they generally appear in that part of the sky from which the system is approaching. The relation of cirrus clouds to atmospheric depressions is very intimate, and their appearance often indicates wind as well as rain.

With the approach of bad weather, cirro-stratus usually forms and resembles a sheet spread over the sky; it is usually safe to expect rain when cirro-stratus forms over cirrus, or, in other words, when these clouds are descending. On the other hand, when cumulus clouds are present and cirro-stratus forms, fine weather generally follows. These conclu-

sions are, however, not laid down as absolutely unvarying; occasionally it will happen that from other causes the usual sequence of changes will be interrupted. Cirro-cumulus is essentially a fine weather cloud, and has never been known to precede rain. The types stratus, cumulus, strato-cumulus and nimbus are generally termed lower clouds. Stratus is generally a fine weather cloud, and appears in the evening and morning of the brightest days. Cumulus is an evaporation cloud, appearing in its most massive and resplendent forms when evaporation is at its highest. Sir John Moore \* gives the following example of the formation of cumuli:—"As a land cloud, it may be best studied in summer or autumn. A rain-bearing depression, we will suppose, has passed away, and the sky has cleared completely at or after nightfall. Terrestrial radiation has full play during the ensuing night, and towards morning the air is damp and very cold for the time of the year. The morning breaks without a cloud, but when the sun's power begins to increase, a few soft, scud-cumuli begin to fleck the deep blue sky. These clouds rapidly develop in size and density, and rise to a higher and higher plane, as the line of saturation ascends with the rising temperature near the earth's surface. At last the cumuli become piled up into threatening masses, with snow-white, sharply defined crests. Their summits now begin to spread out in front into a fan-like, cirriform crest, and simultaneously a heavy shower of rain or hail may be observed falling from the base of the cloud mass."

Strato-cumulus is, as its name implies, a combination of the types stratus and cumulus. Nimbus is the rain cloud, and heralds thunder and heavy downpours. It is composed of a sheet of cloud above which is spread the cirrus, while the cumulus enters it laterally and from beneath. It is really the shower cloud or a mass of cumulus which is being rapidly condensed into rain, hail or snow.

We have seen how a cyclone will cause the wind to blow inwards to the vortex, with the hands of a watch, and how this order is reversed in the case of an anti-cyclone, and, by the aid of Buys Ballot's law, we may easily decide whether the cyclone is on our left or right. This law states:—In the

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\* "Meteorology, Practical and Applied," London, 1910.



southern hemisphere, stand with your back to the wind, and the barometer will be lower on your right than on your left. Thus, if the wind is west, the centre of depression is towards the south, while if the wind is south, the centre of depression is east, and so on. The force of the wind is measured by the Beaufort scale as follows:—

TABLE FOR ESTIMATING FORCE OF WIND (Beaufort's Scale).

| Force. | Common Designation.    | Visible Effect of Wind.                                   | Velocity in miles per hour. |
|--------|------------------------|---|-----------------------------|
| 0      | Calm or very light air | No visible motion of leaves; smoke rises vertically       | 3                           |
| 1      | Light air              | Causes smoke to move from the vertical                    | 8                           |
| 2      | Light breeze           | Moves leaves of trees                                     | 13                          |
| 3      | Gentle breeze          | do do   | 18                          |
| 4      | Moderate breeze        | Blows up dust; moves small branches of trees              | 23                          |
| 5      | Fresh breeze           | Sways ordinary trees                                      | 28                          |
| 6      | Strong breeze          | Sways the largest trees                                   | 34                          |
| 7      | Moderate gale          | Breaks small branches                                     | 40                          |
| 8      | Fresh gale             | Breaks larger branches                                    | 48                          |
| 9      | Strong gale            | Breaks down exposed shrubs and small trees                | 56                          |
| 10     | Whole gale             | Prostrates exposed trees, small trees and frail houses    | 65                          |
| 11     | Storm                  | do do do  | 75                          |
| 12     | Hurricane              | Prostrates the stoutest trees and the strongest buildings | 90                          |

The wind force is an important factor, and will be found to vary in proportion to the steepness of the barometric gradients.

Briefly summarising the foregoing, we may say that, generally speaking, the steady decline of the barometer in front of a cyclone indicates rain, while the rapid rise in the rear brings settled weather. We have also seen why the barometer sometimes fails in its indications, why we have rain when the mercury is rising, and settled, fine weather when it is falling. Combining our barometric observations with those of clouds, halos, etc., we can, however, generally determine whether or not rain will fall. We know from the wind direction and its apparent force whether we are to the left or right of the cyclone and what weather we may expect in consequence.

We examined, briefly, the manner in which moisture was taken up into the air, condensed, and subsequently precipi-

tated, and we saw how halos and coronæ were formed, and remarked the general indications of different types and combinations of cloud. We also discussed the origin of dew and frost, and indicated means by which these forms of precipitation could be anticipated. So much, then, for the science; it remains now for the student to acquire a knowledge of the weather changes in different seasons and apply his science to their interpretation. It has been said that our early rains are always preceded by several days of threatening aspect, but that rain does not actually fall until it has "banked up" for the third or fourth time. This may or may not be true, but it is to knowledge of this sort that much of the success of an individual forecaster is due. A certain amount of truth is attached to the old prognostic of the South American Indians: "When you can hang your powder horn on the end of the moon you may hunt"; that is to say, when the new moon is elevating its points upwards, the following month will be a dry one. The old English prognostic is also said to be applicable to Rhodesia:—"A red sky at night is the shepherd's delight; a red sky in the morning is the shepherd's warning." The "night" and "morning" would, in this case, apply to the hours just before sunrise and after sundown.

In conclusion, it is as well to repeat that success as a forecaster does not come in the nature of an inspiration. The oldest students make mistakes, and errors in judgment on the part of beginners should not deter them. Experience will soon indicate just how far one may rely on certain indications, and time spent in acquiring such experience can never be wasted.

# Report of Veterinary Conference

(CONTINUED.)

## MODIFICATION OF REGULATIONS IN CONSEQUENCE OF EXTENSIVE DIPPING OPERATIONS.

Mr. Sinclair explained the regulations in force in Rhodesia, and went on to say that the question was, could they relax or modify their quarantine precautions in consequence of the proved effectiveness of dipping? He was inclined to adhere to the practice they had hitherto adopted, viz. : to impose quarantine regulations on a rather large area. As he had already said, he was of opinion that farmers might be lulled into a false state of security by dipping, and he was afraid that if quarantine restrictions were relaxed they might find a patch of infection which had been masked by the regular dipping. As far as his present knowledge and experience went, he considered it was not advisable to make any alteration in the quarantine regulations.

Mr. Gray said that at the present time in the Union if there was an outbreak of Coast Fever the farm where the outbreak occurred was put in quarantine for fifteen months from the date of the last animal dying. No movement of stock at the adjoining farm could take place except by the personal written authority of the Principal Veterinary Surgeon, and that was only granted in very extraordinary circumstances. Proceeding, Mr. Gray referred to the good results obtained by dipping, but at the same time expressed the opinion that they had still something to learn about Coast Fever, and he deprecated any relaxation of the present regulations.

Mr. Garden was very anxious to know the position in North-Eastern Rhodesia in regard to African Coast Fever, more especially that portion of the territory lying along the southern districts of Nyasaland.

Mr. Chambers said that as far as he knew there was no Coast Fever in North-Eastern Rhodesia, and he did not anticipate an outbreak there. There were very few cattle there, and an outbreak was not feared.

Mr. Edmonds said that as far as he could gather the methods applied had been most successful in Portuguese East Africa, and secondly in the Transvaal. In subsequent remarks, he referred to the fact of the disease breaking out after a period of eight years, which was rather a long period for a sub-acute case. He was of opinion that there was still a good deal to be learnt about the disease.

Mr. Sinclair remarked that it was an extraordinary thing that native cattle were so little infested with ticks.

Mr. Garden said that the position in Nyasaland was that in the northern portion of the territory Coast Fever was endemic. Coast Fever had not been diagnosed in other parts of the territory, but he believed the disease existed throughout Nyasaland.

In reply to a question, Mr. Gray expressed the opinion that the disease existed in the northern part of Rhodesia in an endemic form.

Mr. Chambers did not share this opinion, for a veterinary surgeon was sent to that portion of the territory to enquire if Coast Fever existed there, and he reported that as far as he could ascertain it did not. There were cattle imported from England in North-Eastern Rhodesia, and they had not died.



## TUBERCULOSIS.

Mr. Gray, in introducing this question, said it was one of increasing importance to all stock-raising communities in South Africa. At one time he was of the opinion that tuberculosis was practically non-existent in South Africa, and there was good reason for assuming this. He never came across tuberculosis in Rhodesia when he was stationed there, nor did he see any occurrence of the disease in any Madagascar cattle; he was surprised to hear later that cattle from the latter place had been found suffering from tuberculosis. After he went to the Transvaal very little tuberculosis came under his notice, but at the same time he was pretty well convinced that amongst the classes of animals they were getting in the Transvaal there must be a good deal of tuberculosis. The great difficulty in getting any idea of its prevalency lay in the fact that there was no adequate system of meat inspection in vogue, and it was to meat inspection that one had to look for aid in the detection of tuberculosis. From time to time at the Experimental Farm belonging to the Transvaal Government an odd case of tuberculosis occurred, and they endeavoured consistently to get stock-owners to come forward and have their animals tested, but there was very little response to the invitation because the regulations did not permit of anything like payment of liberal compensation in the event of the animals being destroyed. Later when an abattoir was established in Johannesburg and a regular system of meat inspection instituted, then they began to hear a little more about tuberculosis. They followed up in-contacts of cases of tuberculosis found at the abattoir, and the conclusion was forced upon them that amongst well-bred cattle in the country there was a good deal of tuberculosis. When Union came about the matter received further attention, and the observations that had been made since that event confirmed all the opinions previously expressed about the prevalency of the disease. It had steadily increased, particularly amongst herds of thorough-bred stock. Their great difficulty had been to get people to realise the importance and necessity of testing animals. The amount of compensation offered in case an animal was destroyed, he considered, was not sufficient inducement to a man to come forward and have his animals tested. They modified their regulations in this respect last year to the extent of inviting people to have their cattle tested, and gave them the option of isolation under efficient supervision. Several serious outbreaks of the disease had been detected in Natal. That province at one time declared it was practically free from tuberculosis, but the disease had been discovered since then. In many cases the outbreaks were traced to Madagascar cattle, while in others they were traced to animals brought from Australia before testing methods were in vogue. Mr. Baynes had a very serious outbreak amongst his dairy herd. He had a dairy herd of 150 cows, and upon the herd being tested at his request some 50 animals were found to be suffering from the disease. There were about 1,500 in-contacts, and a considerable number of these animals were found to be infected with tuberculosis; not only amongst milk animals, but, contrary to general experience in this country, amongst oxen. They had always endeavoured to get people to take advantage of their offer to test animals. He had pressed the matter with owners of dairy herds in Durban, Pretoria, Johannesburg and Maritzburg, and pointed out how necessary it was in the interests of public health that animals should be tested, and in every place the experience had been that dairymen came forward until a bad lot was struck, when there were no more candidates for testing. Their regulations at the present time gave owners the option of destruction in the event of re-action with a small amount of compensation, or isolation under conditions the Government saw fit to impose. They did not encourage isolation, because the restrictions imposed were very rigid, and in many cases the owners would rather have the animals destroyed. In the case of imported animals, it was their policy to destroy any that re-acted, without compensation.

There had been a good deal of heart-burning. Owners had imported animals at great expense after they had been tested at Home by a reliable man, and these had afterward's re-acted and been destroyed and no compensation paid. Just a little time ago a bull belonging to the De Beers Company, costing £500, re-acted and was destroyed, no compensation being paid.

A similar case occurred in the Western Province. One of the difficulties they had to contend with in cattle imported from England was that the infection in most cases was very slight indeed. Professor McFadyean appeared to indicate, when giving evidence before the Tuberculosis Commission, that if an animal was infected with tuberculosis there was an interval which varied considerably before there was any re-action to tuberculosis. This, he said, varied from 8 to 10 days up to 56 days. His (the speaker's) opinion in regard to a lot of the cattle found to re-act after coming to this country was that no precaution had been taken of verifying the test. Imported animals were very unsatisfactory in dealing with.

It was very difficult to satisfy an owner of a £500 animal that the presence of a small tubercle in one lymphatic gland was sufficient to destroy it, and very often even the tubercle could not be found. Proceeding, Mr. Gray referred to a case of this kind in the Orange Free State, and went on to say that in days gone by there was a good deal of tuberculosis believed to exist among animals in the Cape. He did not think it was very prevalent there; at least the percentage of animals they found suffering from the disease did not point to any great prevalency, for out of 17,000 head tested, only a little over 3 per cent. were found to re-act. As he had said before, their difficulty was to get co-operation from the people who owned stock. It used to be the current belief that some dairy owners in the Cape tested their animals on the quiet, and shipped any re-acting to Johannesburg. He was inclined to believe that in some cases this was done, and now the Government was taking steps to restrict the importation and sale of tuberculin. Under the existing regulations no one was allowed to import tuberculin and no one was allowed to be in possession of tuberculin unless he held the authority of the Principal Veterinary Officer.

Mr. Verney said that with regard to the destruction of animals, this was of very great importance to them in South Africa. In Europe it was accepted that the greatest factor in the distribution of bovine tuberculosis was housing, and he must say that he had been a fairly rigid disciple of that contention, but there was little doubt that so far as South Africa was concerned, that doctrine did not hold good. If that doctrine did hold good, it would be fairly safe to say that the bulk of bovines in South Africa had no risk of becoming tubercular, because at a moderate estimate 99 per cent. of the animals did not see the inside of a stable. One owner he knew in Natal had imported Shorthorn cattle for 16 years, and it was discovered some little time ago that tuberculosis existed on his farm. This man, for the most part, did not house his cattle in any way, any more than did the average cattle-owner of this country, and upon his herd of 200 pedigree stock being tested some 55 per cent. of the animals re-acted to tuberculosis. A curious thing about this case was that the bulk of the re-acted cases were young animals. Quite a large percentage of the animals that re-acted had never seen the inside of a stable, and he believed that in Natal that had been quite a common experience. Knowing that to be the case, it certainly behoved them to keep a sharp eye on tuberculosis. They had, in the past, a very good illustration that tuberculosis was rife in the southern part of Madagascar, and there these animals were not housed. Of course, they had to realise that in South Africa the treatment of cattle was undergoing a considerable alteration. Dairying was assuming very much larger proportions than before, and in many centres this had led to cattle being kept under artificial conditions, which meant that the animals were more likely to contract the disease.

Mr. Sinclair said that, so far as was known, Rhodesia had enjoyed a most extraordinary immunity from tuberculosis, excluding animals which re-acted to the tuberculin test upon arrival from Great Britain. With the exception of these, only two cases were recorded, both the animals being imported from the Western Province of the Cape. The cases were discovered by the Government Veterinary Surgeon at Umtali. No one had any idea that the disease existed in the herd until a *post-mortem* was held upon an animal that died, when the cause of death was found to be tuberculosis. The whole herd was tested, and another case discovered. This was four years ago, and since then the herd had been under observation, but no further



case had occurred. At one time he held the same view as Mr. Verney, and he supposed that most of them held that housing was more or less responsible for the spread of the disease. Mr. Gray had mentioned that he had found oxen infected with tuberculosis. That went a long way towards changing conditions in this country, and there was no doubt that by importing large numbers of well-bred animals the risk of tuberculosis increased correspondingly, and if it was established by the introduction of overseas cattle, there was serious danger of infecting the native-bred cattle. When they re-opened the Cape Colony about six years ago for the importation of young stock, there was a good deal of discussion in the Cape Province about the existence of tuberculosis, namely, in the Western Province, and as a result of the information obtained, it was decided by the Government of Rhodesia to enforce the tuberculin test on all two-tooth animals imported from the Cape. About 2,000 animals were tested without a single re-action, but, of course, testing large numbers of young bulls or heifers was a very unsatisfactory process. It was impossible when cattle were imported in large numbers to detain them for any length of time in quarantine, in order to let them settle down and get an even temperature. It was also very difficult in handling large numbers of young stock to take temperatures. However, after testing this large number of animals without the detection of a single case, it was decided to allow the introduction of animals without the application of the tuberculin test, and that was the procedure to-day. Of course, animals from overseas were tested for tuberculosis upon arrival. In this connection, Mr. Sinclair mentioned they had had some very unfortunate results. The Central Estates Company imported eight bulls last year, and upon the application of the tuberculin test, five re-acted and were destroyed. In each case there was no difficulty in finding lesions of tuberculosis. These animals were tested at time of purchase, but foot-and-mouth disease broke out, and they had to remain in England for several months. The agents who shipped the cattle did not have them tested immediately before shipment, with the result that five out of the eight upon arrival here had to be destroyed. The remarks of Mr. Gray and Mr. Verney had rather startled him about importation of cattle to this country, and it was a matter that would have to be gone into. Still it would be a very difficult matter to apply the tuberculin test to the large numbers of young stock which were being imported into Rhodesia from the southern States. He thought there was one thing in their favour, and that was the age which was imposed in Rhodesia on animals introduced. The age limit had been a great bone of contention for many years, but the Veterinary Department had managed to hold its own, and maintain the limit to animals with not more than two broad teeth. There was a proposal under consideration at the present time which was agreed to at the last meeting of the Agricultural Union, that the age limit should be increased for animals in the South African Stud Book only. Well, he was of opinion, after what he had heard from Mr. Gray, that it would be safer to bar Stud Book animals, and upon his return to Salisbury, when the matter came before him for consideration, he would certainly point out the increased risk of tuberculosis by the adoption of the proposal. What the Government would decide he could not say, but although a little time ago he had recommended the increasing of the age limit to four-tooth animals, he would now advocate that the two-tooth limit be adhered to.

Mr. Gray thought that the Rhodesia Government would be very well advised to adhere to the two-tooth limit, because with animals of that age the chances of getting infected beasts were very small. This was not the case with older animals; and more particularly with pedigree stock, which were more susceptible to the disease than all others.

Mr. Sinclair: You say there are seven districts of the Western Province from where no animals are allowed to leave except they are tested and found free from tuberculosis?

Mr. Gray: There are four districts, Paarl, Malmesbury, Stellenbosch and Cape. No breeding animals are allowed to leave these districts unless they are previously subjected to the tuberculin test and passed by a Government Veterinary Surgeon.



Mr. Sinclair : In cases of cattle imported from overseas, do you test a second time after an interval of several months?

Mr. Gray said he was a strong believer in the efficiency of the first test. If a characteristic re-action was attained, he advised them strongly not to repeat the test. A good many people, when an animal re-acted, said, "It is a re-action, but not a very bad one. Won't you allow me to wait for a while and re-test the animal?" His advice in such cases was not to do anything of the kind. In testing a herd, even if a re-action was obtained which was considered doubtful, he advised them to put the animal amongst the bad ones, and not take the change of infecting healthy animals. Replying to a remark by Mr. Stordy, Mr. Gray said that it was dangerous to accept certificates that animals were free from tuberculosis.

Mr. Chase said that for a time he was under the impression that there was no tuberculosis in the Bechuanaland Protectorate. He had never detected a case until animals were sent to the abattoir in Johannesburg. The animals infected only amounted to about 1 in 5,000, but he could not quite understand how these isolated cases occurred. In subsequent remarks, Mr. Chase enquired whether it would not be possible to establish a station in England, with an officer nominated by South Africa in charge, for the purpose of testing animals before export to this country.

Mr. Gray said he did not consider the position in regard to the testing of animals in England at all satisfactory. The question was now under consideration as to whether a testing station should be established in England under Government supervision, and he thought it would go through. Unfortunately, as far as their farmers were concerned at the present time, they were debarred from benefiting by that, because all imported animals had to be tested, and if they re-acted, destroyed. In subsequent remarks, Mr. Gray mentioned that in this country there was a good deal of tuberculosis of human origin amongst pigs.

Mr. Verney referred to a case in Natal, where circumstances pointed to animals getting infection from the inhabitants of a sanatorium close by.

#### INTER-COLONIAL MOVEMENT OF STOCK.

Mr. Gray said that as far as the introduction of stock into the Union from overseas was concerned, the position was that they allowed bovines to be imported from America, Great Britain, the Netherlands, and Germany. In the case of the Netherlands and Germany, a veterinary certificate had to be obtained to the effect that the animals were free from foot-and-mouth disease, and they were subjected to a fifteen days' quarantine at the ports. As far as America, Great Britain and Ireland were concerned, this restriction was waived. As regarded the importation of other stock, he had always told importers in the South to make direct application to the Veterinary Department. They could not lay down a whole list of causes upon which they were not prepared to allow importation, but they required the would-be importer to satisfy them that the country from which he wished to export his animals was free from disease of a character likely to establish itself in this country. They did not allow any cattle to be imported from Madagascar. Neither was importation permitted from the East Coast, from Mauritius, nor from India. As far as the various provinces of the Union were concerned, they were allowing stock into the Transvaal, the Cape and Natal. They had closed parts of the Cape, viz., Kingwilliamstown and East London. From the adjoining districts of Stutterheim, Cathcart, Woodhouse and Elliott, movements of cattle were only allowed where the owners had dipping tanks and could satisfy the Department that the stock was free from disease, and had been in their possession on the farm from where it was desired to move them three months prior to the application to move. The reason for these regulations was that they were afraid of cattle running from the Transkei. In Natal they only allowed movement of cattle from a small section of the country which lay along the Transvaal border, in which there had been no Coast Fever at all, and where dipping operations were carried on.

Mr. Sinclair said that in regard to the importation of stock from overseas, Rhodesia was fortunate in having two buffers between herself and

the coast. At the present time, importation *via* Beira was prohibited, and there was no immediate intention of modifying that restriction. Importation was permitted *via* Cape Town. At the present time, importation of cattle was not permitted from any countries except Great Britain, Ireland, the Netherlands and United States. The position he had taken up was that the regulations of the Union were a sufficient safeguard to Rhodesia. He could not state it with sufficient authority, but he thought in time Rhodesia would be prepared to admit cattle from countries from which the Union allowed importation. There was one important point in connection with importation from overseas, and that was the position of cattle in transit. Several applications had been received lately to import cattle from Madagascar to the north. The prevalence of tuberculosis in Madagascar was sufficient cause for prohibiting cattle from there even to pass through the country, but there were other reasons. He regarded all Eastern countries as possible sources of danger. There was always the possibility of introducing some insect-borne disease, and he thought before cattle in transit from those countries were allowed to pass through, the very gravest consideration should be given to the matter. He had pointed out that no cattle could be allowed through in transit except from countries from which importation into Rhodesia was permitted, and under the conditions imposed by the Rhodesian regulations. The two-tooth limit would not, however, be applied to animals in transit. At the present time it was perfectly open for the territories to the north to import cattle from the Orange Free State or Cape Colony, and if the question were brought up there would be no objection to cattle from Bechuanaland passing through Rhodesia, provided they were not de-trucked *en route*, and were not forwarded by a train carrying cattle for Southern Rhodesia. He had referred to this matter because it was of considerable importance, but he presumed that in the event of cattle being imported from overseas for the northern territories, Mr. Gray would deal with the matter first. All that was necessary for him (the speaker) to do at the present time was to let people know that their application would be considered.

Mr. Jones enquired if there was any chance of importations to the southern States through Beira being permitted within the next ten years.

Mr. Sinclair said they might some time in the future open Beira as a port of entry for cattle for Rhodesia, providing there was no objection to the country from where the cattle came from.

Mr. Jones: Have you any objection to cattle in transit providing they are forwarded in fly-proof trucks?

Mr. Sinclair: Your country is rather tropical, and I am not prepared to change my view, which is that it is not advisable at present to allow cattle to land at Beira even to come through Southern Rhodesia.

Mr. Botelho read the regulations in force in Moçambique, and explained that cattle were allowed to be imported from the Transvaal with a veterinary certificate.

#### LUNG-SICKNESS.

Mr. Chase, introducing this subject, said that the Bechuanaland Protectorate really made a start to tackle the disease in 1909, and a sum of £5,000 was voted for the purpose of eradication. At the same time a proclamation dealing with the disease was promulgated, and from that time it had been handled with effect. The regulations were fairly stringent. Owners of cattle had to report any outbreaks that might occur in their herds, otherwise a fine was imposed. Upon receipt of the report the Government took over the control of the herd, all infected animals being destroyed and compensation paid, while a period of quarantine lasting two months was imposed in regard to the uninfected beasts. Inoculation was also resorted to, and in 1910 the number of animals so tested amounted to 30,000. The work was continued in 1911, but for some considerable time very little improvement was effected. However, the position improved during the next year. He had with him a report which shewed that on the 1st January, 1912, there were 3,000 animals in quarantine for lung-sickness. Following the report month by month, it would be found that with a little variation



there was a steady decline in the disease until November, in which month not a single outbreak occurred, while in December there was only one. The position up till that time was quite satisfactory, and if that Conference had been held last January he thought he would have held out more hopes than he could to-day. Unfortunately they had to close down their concentration camp, which had been their sheet anchor in combating the disease. During the last six weeks, nine outbreaks of the disease had occurred. They could not send the infected animals to the concentration camp, and had to quarantine them. It was very disappointing after nearly eradicating the disease to find that it had got a fresh start.

Mr. Verney thought it would be interesting if Mr. Chase would give the results obtained by inoculation and the conclusions he came to.

Mr. Chase explained the methods of inoculation used by him, and said that the results generally were satisfactory.

Mr. Stordy said there was a little lung-sickness in British East Africa. The natives there feared the disease so much that they would quarantine their animals of their own accord.

### EPIZOOTIC ABORTION.

Mr. Gray said he could not say much about this subject. They had a strong suspicion that this disease did exist in the Union at the present time, but they had not been able to demonstrate anything. The history of a number of cases in which repeated abortions had taken place suggested that the disease did exist, but its existence had yet to be found by experiment. In those cases where abortion was suspected they advised owners not to sell their animals, because an attack conferred subsequent immunity.

Mr. Verney said that during the last two or three years he had visited certain herds, and he had little doubt that epizootic abortion existed in the Orange Free State. He feared the disease might assume a very serious proportion in South Africa. It was far more prevalent than was realised.

Mr. Sinclair said the remarks made by Mr. Gray regarding the presence of epizootic abortion in the Union exactly applied to Rhodesia. Several suspicious cases had occurred, and although close enquiry had been made, they had not been able to demonstrate its existence satisfactorily. He would like an expression of opinion from members of the Conference as to the possibility of it being introduced from England, and whether it was possible to enforce any conditions to prevent such introduction.

Mr. Robertson: You can test for it.

Mr. Verney: It is a marvel to me it has not been introduced into this country, seeing its prevalency in England.

Mr. Robertson said he thought epizootic abortion existed in South Africa.

### ANTHRAX.

Mr. Chase said there had been a very big increase in the number of cases of anthrax in Bechuanaland and Bechuanaland Protectorate lately, but it was more particularly with regard to inoculation that he wished to put his case before the Conference. It seemed to him that, as a profession, they were not quite unanimous as to whether inoculation should be adopted or not. They should, he thought, get a little unanimity on this point. Proceeding, Mr. Chase mentioned that in the Kimberley district 40,000 animals were inoculated every year, and in the Vryburg and Mafeking districts some 2,000 were treated. This was done annually as a preventive. He had found that by inoculating, animals never contracted anthrax. After inoculating for the last eight or nine years, he was convinced that inoculation conferred 12 months' immunity. With regard to the vaccine used, Mr. Chase said this was obtained from Europe, and it seemed to him a point whether this was sufficiently effective by the time it arrived here. He would like to ask Mr. Robertson how long such vaccine would keep, and whether it would not be possible to manufacture it in this country. In further remarks, Mr. Chase said he was not prepared to recommend inoculation in cases where



the disease had been contracted, but he certainly would as regarded in-contacts

Mr. Gray said the point raised by Mr. Chase was a very interesting one. If inoculation was omitted after it was started, animals would undoubtedly be lost, but, on the other hand, if odd cases occurred, the question arose as to whether it was expedient to establish centres of veld infection by inoculating a whole lot of animals. He put the question when he was at home to Professor McFadyean, because he was exercised about the increasing prevalence of the disease in the Western Transvaal, and was informed that it was not advisable to commence inoculation operations because they had to be kept up. That was if the disease was only sporadic. He (the speaker) impressed that on his staff. Proceeding, Mr. Gray said that the district where they experienced the greatest trouble in the Transvaal in dealing with the disease was on the Witwatersrand, where it was now an offence to fail to report the existence of an outbreak. The position had been gradually getting worse in the Transvaal, simply because of the lack of care of farmers in disposing of the carcasses of animals dying from the disease. They were using more vaccine in the Transvaal to-day, and were going to use more in the future.

Mr. Robertson said he was afraid he held rather heretical views as far as Professor McFadyean was concerned, for he did not think that the inoculation of cattle with vaccine permanently infected them. He might be wrong, but that was his experience. He thought they should be rather chary of accepting the views of people, who had never been here, regarding what was applicable to this country. Anthrax in Europe was different to the form it took in South Africa. Their knowledge of anthrax in this country had been immensely increased since they had carried out a system of diagnosis of African Coast Fever. In Europe any one who looked at the organisms under a microscope could spot a case of anthrax, but that was not so in this country. Regarding the vaccine used, this was imported from France. He thought material made here would be fresher and better than that supplied by the Institute Pasteur.

Mr. Verney said he had had a good deal of experience of anthrax in South Africa, and agreed that when inoculation was started on a farm it had to be continued. He agreed with Mr. Robertson that anthrax could assume a much milder form here than in Europe. He had noted the fact that Mr. Chase had appealed for unanimity in regard to the treatment of anthrax, but Mr. Gray had put the situation in a concise way by saying they were all agreed that where there was no danger of the disease spreading in a herd, there was no reason for inoculation. If it was likely to assume serious proportions, then inoculate.

Mr. Chambers asked Mr. Sinclair whether there were many outbreaks of anthrax in Southern Rhodesia among native cattle. Anthrax, he stated, broke out annually amongst native herds in Northern Rhodesia, the mortality being very high.

Mr. Sinclair said he had not had much experience of anthrax. As far as his records went (he was open to correction on the point), there had only been three recorded cases in Southern Rhodesia. One of these occurred in 1908 at the Rinderpest Station at Ramaguabane. Last year there was an outbreak a few miles from the Bulawayo Commonage, and another on some plots adjoining the Salisbury Commonage. At Bulawayo, bovines were affected, and at Salisbury a donkey and some pigs were affected. They had endeavoured to limit the spread of infection by burning the carcasses and fencing off the ground where the carcasses were opened. Of course, it was quite possible that other outbreaks had occurred in Southern Rhodesia and escaped detection. It would be rather strange to find the territory free, seeing that the disease existed on all sides. The probability was that anthrax did exist in Southern Rhodesia to a considerable extent that had not been apparent since the occupation, by reason of the destruction of practically all the cattle by rinderpest, in the first instance, and later by African Coast Fever. With the increased number of cattle in the country, he would not be surprised to find anthrax cropping up in various districts.

The following resolution was proposed by Mr. Chase, and carried unanimously :—

That in view of the delay caused by importing anthrax vaccine from Europe, an endeavour should be made to prepare it in South Africa.

#### TRYPANOSOMIASIS.

Mr. Robertson said he had little acquaintance with trypanosomiasis except in the laboratory and on the experimental side. Trypanosomiasis in the Union was confined to certain well-defined areas in Zululand, where the *T. Brucei* was known to exist. He had had this strain in the laboratory for some time, and up to quite recently regarded it as pure *T. Brucei*, but at the request of Sir David Bruce he had sent certain inoculated rabbits to Nyasaland, and that authority had stated that the trypanosomes found in these rabbits were indistinguishable from *T. Rhodesienses*, one of the forms of human trypanosomiasis, and supposed to habitat in game. Mr. Robertson went on to state that any knowledge of the varieties and differences between various trypanosomes was rudimentary, and that strict quarantine should be maintained against trypanosome areas until it was definitely settled how far the ordinary biting flies were responsible for their transmission. Mr. Robertson said that the distribution of trypanosomes, particularly *Brucei*, and the question of game reserves and the clearing of the settled country of big game, was a matter of vital importance to the stock farmers in these areas.

Various members of the Conference related the situation in regard to tsetse fly and trypanosomiasis in their respective territories.

#### ESTABLISHMENT OF SERUM STATION IN ENGLAND.

The following resolution was proposed by Mr. Stordy :—

That this Conference very strongly supports the proposition of the Imperial Government to establish a station in England for the immunisation of stock against redwater and gall-sickness, and for the testing of animals with tuberculin and mallein prior to their exportation to the Colonies.

It is hoped that the above line of action will be adopted not only by Great Britain, but by other stock-exporting countries.

Speaking to the resolution, Mr. Stordy said he considered that, provided animals for export were kept at the station for about a month and tested, it would be unnecessary for them to be re-tested on arrival in the Colonies.

Mr. Gray said that one point to which he would direct attention was that, supposing the Imperial Government decided to take some steps about the establishment of such a station, it would then be incumbent upon the various Colonies to refuse admission of any stock which had not passed the test. They would have to take up this attitude, otherwise the position would become rather difficult, because he felt quite sure that many butchers, at all events, would object very strongly to sending animals to a station of that sort, and then having animals thrown on their hands.

Mr. Sinclair endorsed every word Mr. Gray had said, and he thought that if the facilities suggested were granted there would be no trouble in restricting the introduction of cattle into Southern Rhodesia to those which had been tested at the station.

Mr. Robertson considered there should be some Colonial control at such a station.

Mr. Stordy pointed out that the station would be for the benefit of the Colonies, and if the Imperial Government agreed to establish it, they (the Colonies) must find out how it was going to be established.

Mr. Gray agreed with Mr. Stordy. The point was, if the Imperial Government were going to take the trouble of establishing a testing station for the purpose of assisting the Colonies, they would certainly see that it was conducted in such a way as to attain this end.

The resolution was carried unanimously.



## Correspondence.

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### HINTS ON BRICKMAKING.

To the Editor,

*Rhodesia Agricultural Journal.*

Sir,

Adverting to Mr. G. T. Dyke's "Hints on Brickmaking," will you allow me to suggest some modification in the building of the kiln?

It is generally admitted that unburned bricks are less liable to fracture when laid on edge than when laid flat. Mr. Dyke's dimensions imply that the bricks should be laid "on the flat side." It would undoubtedly prove more efficient if the dimensions were given on the assumption that the bricks lie edgewise.

Yours, etc.,

C. S. HERON.

Eagle's Nest,

Headlands,

31st December, 1913.

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### HINTS ON BRICKMAKING.

To the Editor,

*Rhodesia Agricultural Journal.*

Sir,

Mr. G. T. Dyke's footnote to Mr. Harry Gammon's useful letter urges me to write and substantiate what Mr. Gammon says. Not only are holes all that is necessary, but they are decidedly more convenient. The moulder should not have to bend to his work; the table would, therefore, be rather high—3 ft. at least. And it *must* be a *firm* affair, putting the farmer to considerable expense. A hole 3 ft. deep and 18 ins. in width,



a piece of scaffolding board 6 or 7 ft. long on the ground for the moulder to work at, and a square hole large enough and deep enough to hold two or three moulds, directly in front of the moulder, are all that is required.

Using this method, four good boys and myself turned out, on an average, 1,000 bricks per diem. A great secret in any such work as moulding bricks is to systematise the job and reduce it to the fewest possible movements.

Mr. Gammon is right about good bricks being made from vleis soil, and his tip *re* lime should be emphasised. We ran into lime in the form of small flinty pieces, which were not recognised until after the burning. They burnt to a powder and *burst* the bricks.

We burnt with flues running right through the kiln. The last batch of 30,000 were burnt during frightfully windy weather, and I built the kiln with flues facing the wind. To make stoking possible on the leeward side, I built a wall through the centre of the kiln and across the flues. The burning was a complete success.

Yours, etc.,

WALTER E. SHELLEY.

Bulawayo,

27th December, 1913.

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### LIVE STOCK INSURANCE—CORRECTION.

To the Editor,

*Rhodesia Agricultural Journal.*

Sir,

I shall be glad if you would correct two mistakes in my letter, *re* cattle insurance, which appeared in the December number of the *Journal*.

Six per cent. is quite wrong. It should be 6s. (six shillings) per unit. And, again, "past" value should read "part" value.

Let me illustrate the unit of subscription.

Suppose there are four subscribers—

- A has one animal;
- B has three animals;
- C has two animals;
- D has four animals;

and for example's sake, assume the animal is valued at £10 and that it is one of B's—

- A pays £1;
- B pays £3;
- C pays £2;
- D pays £4;

B thus gets from others £7.

I am sorry that the mistake should have been made, as if people work out 6 per cent. on £21 they may make it about £1 4s.

$$\begin{array}{r} 21 \\ 20 \\ \hline 420 \end{array}$$

instead of six shillings.

I will give a better example. Say a bull died and his original cost was £70, and he is insured for £50, and that there are 250 bulls insured.

Let the owner be A.

Now £50 is to be made up by 250 units of subscription of 4s. each.

B keeps and insures four bulls—he will pay 16s.

C keeps and insures three bulls—he will pay 12s.

The 250 bulls might be owned by, say, 200 owners of one bull each, and the remaining 50 might be owned by, say, 10 other owners, whose average ownership was five.

The owners of one bull would only pay four shillings (4s.) each.

Yours, etc.,

C. GREY, Lt.-Colonel.

Roberts Heights, Pretoria.

## The Export of Hides and Skins.

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Hides and skins are exported to the London market in extremely large quantities, and can be sold upon c.i.f. contracts quite easily. They are sent away from the Cape in three states, namely, wet-salted, dry-salted and dry.

**WET-SALTED HIDES.**—These are sold in two weights, heavies and lights. The former usually average from 59/65 lbs., landed in fair condition, and the lights run from 39/44 lbs. Current value c.i.f. London on London landed weights is 9d. for heavies and 8½d. for lights. The latter, however, are in very small supplies.

**DRY-SALTED HIDES.**—These are sold in:—

Extra heavies, av. abt. 29/35 lbs., at 12¾/13¼d.

Heavies, av. abt. 19/23 lbs., at 13¼/13½d.

Lights, av. abt. 10/12 lbs., at 13¼/13½d.

Kips and skins, av. abt. 6/7 lbs., at 12½/13½d.

Kips and skins, av. abt. 4/5 lbs., at 12½/13½d.

Calf, av. abt. 3½/4 lbs., at 12½/13½d.

**DRY HIDES.**—These would have to be poisoned before exporting, otherwise they would reach London probably in quite a different state to the one in which they left the Cape. They are sold in the same weights, roughly speaking, as the dry-salted, and current values would range from about 1d./1½d. per lb. more than for the dry-salted. The values given are understood to be for good quality hides and good sorts and for bests. The quality assortment of dry and dry-salted is made into firsts, seconds, thirds, and fourths. Seconds are about 1d./1½d. below the price of bests, excepting for kips and calf, which are generally about 2d./3d. lower. In wet-salted hides, there are not many seconds, and the few that come usually work out at about ½d. per lb. less. There is no grade below seconds in wet-salted hides.



GOAT SKINS.—These are divided for weight into:—

Heavies, av. abt. 60 lbs., at 11/11½d.

Mediums, av. abt. 48 lbs., at 11d.

Lights, av. abt. 36 lbs., at 12½/13½d.

Ex. lights, av. abt. 24 lbs., at 13/13½d.

Dry, damaged, av. abt. 6/7½ lbs., at 7/9½d.

With very few exceptions, they are exported in the dry-salted state, and the prices above are current values for Algoa Bay.

There are produce firms in South Africa dealing largely in hides for export, but consignments can, of course, be sent direct to London brokers, in which case, where one is dealing with proper standardised lines, it is better for the exporters to make the sale on c.i.f. contract, and thus not involve speculation.

## Reviews.

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*Moçambique; Its Agricultural Development.* By R. N. Lyne, F.L.S., F.R.G.S., Director of Agriculture, Ceylon, and late Director of Agriculture, Province of Moçambique. (T. Fisher Unwin, London, 12s. 6d. net.)

As the writer points out in his preface, the Moçambique Territory, from the farming point of view, is a very young country, and it is, therefore, impossible to dogmatise regarding its agricultural practice or possibilities. The book may be regarded more in the light of a guide to intending planters than as a work of reference, though in some chapters useful information of a general nature is to be found.

Mr. Lyne devotes his most interesting chapters to a discussion of sugar planting, cocoanut planting, rubber and vanilla crops, which appear particularly adapted to the more developed and accessible parts of the territory. Sub-tropical crops, such as cotton, tobacco, ground nuts and maize, receive but passing mention. A short chapter on dry farming, though throwing no new light on this subject, yet sums up the position in clear and concise manner, and it is of interest to learn that the writer considers fallow farming should be experimented with in the dryer districts. Fully one-third of the book is devoted to a description of the country, rainfall and temperature, the natives, land laws, and the fiscal system.

The book will be found of considerable value to farmers and investors interested in Portuguese East Africa, and in this it fulfils the aim of the author.

H.G.M.

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*The Treatment of Horses, Cattle, Sheep and Poultry in South Africa.* By W. van Hensden.

The attention of readers of the *Journal*, and of all other cattle owners in the Territory, is directed to a book named "The Treatment of Horses, Cattle, Sheep and Poultry in

South Africa," by W. van Hensden, and published by Messrs. Juta & Co., Cape Town, price 6s.

The work is mainly a compilation of the literature of the diseases of animals which has appeared in the various agricultural journals of South Africa during the last ten or twelve years. Mr. Van Hensden has judiciously selected what will be found most useful to the stockowner who finds himself in a difficulty in regard to the treatment of animals for the various ailments which affect them in Southern Africa. The value of the work will be appreciated when it is stated that the observations of such well-known authorities as Hutcheon, Theiler, Robertson, Watkins-Pitchford, Gray and others are largely drawn upon, and we have no hesitation in saying that the work should find a place in the library of every farmer.

J.M.S.

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*South African Sheep and Wool.* By W. M. McKee.  
(T. Maskew Miller, Cape Town, 12s. 6d. net.)

We extend a hearty welcome to a handbook for the guidance of sheep farmers in South Africa, prepared by Mr. W. M. McKee, until recently Government sheep and wool expert in the Union. In a preface, Mr. P. J. du Toit, Under Secretary for Agriculture for the Union of South Africa, states that this is the first authoritative publication on sheep husbandry in all its phases as applicable to Cape Colony, but we consider that its precepts will have a far wider sphere of usefulness and will be very helpful to the budding industry in Rhodesia. There has been notable progress quite recently in the Territory in this direction, and Merino sheep are giving good promise of success, but admittedly we have much still to learn on the subject, and this book is calculated to prove of great assistance to beginners.

To be comprehensive, a work of this kind must deal with such general topics as the history of sheep in South Africa, and of the Merino sheep in particular. This leads to a consideration of the various types of sheep and the conditions for which they are suited. Wool is dealt with in detail; its pro-



perties, merits and defects from a commercial point of view, preparation for marketing, shearing, baling, washing, and manufacturing all being comprehensively discussed.

An account is given of the leading British breeds of sheep and of Australian Merino strains, as well as of a few of the principal Cape flocks, although in regard to the latter it is to be regretted that the author did not give much more information, as many flocks at least as well known as those mentioned have been omitted. Without wishing to criticise or disparage the work, it would be most valuable and helpful to sheep farmers to know where certain types are to be found and what the differences are between certain noted flocks.

In a comprehensive work of this kind there must necessarily be much that may be regarded as more or less academic and stereotyped, and this the author frankly admits in his preface, where he says:—"As there are many volumes written on this important subject, I have no hesitation in saying there is nothing in the work beyond applying the experience gained in other countries to South Africa, and whilst drawing on my own experience and knowledge, I have not failed to make use of all the publications at my disposal." It should, however, also be stated that Mr. McKee has judiciously selected only such matter as is applicable more or less to South Africa, and has not padded his book with generalities. He has saved his readers a vast amount of time by concentrating the necessary rudiments of the science and by interlarding with these much that is essentially local in its application. In one handy volume the South African sheep breeder now has an immense amount of useful information which otherwise he would have had to seek widely for and probably never find.

The chapters dealing with breeding, although applying especially to sheep, will prove instructive reading to anyone interested in the subject in general, which is so important a one to the stockowners of Rhodesia at present. With sheep as the example, they will read much which is equally applicable *mutatis mutandis* to other forms of live stock, and which they can usefully adapt to the case of cattle or pigs also. The information conveyed and advice tendered is all of a very practical nature. Thus, in dealing with choice of breeds and types, selection is recommended not of the ideally best, but of

the best for the conditions of climate and pasturage in which the breeder finds himself, while the different varieties of Merinoes adapted to these various environments are elsewhere indicated. The theory of breeding includes the consideration of constitution, pedigree, acclimatisation, early maturity, prepotency, in-breeding, crossing, mating, choice of rams, and kindred topics, whilst the management of the flock is dealt with under such practical headings as condition of ewes and rams at lambing, cross-breeding, selection, feeding in drought, shelter, over-stocking, water supply, sheep yards, dipping, and kindred topics. Chapters will also be found dealing with the preparation of sheep for shows and the more commonly occurring diseases of sheep in South Africa.

In thus summarising the contents of this work, we have endeavoured to indicate its comprehensive and practical character, and the assurance may be given that the reader will find the matter dealt with under these various heads sound and helpful to him for reference in the daily management of his flocks. A fault for which there is little excuse is an apparent carelessness with regard to names of individuals and places, which, although obvious to the average South African for whom the book is intended, is for that very reason the more surprising in a work which has manifestly taken time and trouble to prepare. It is to be hoped that the superficial laxity which allows slips to pass like Fred. W. Southby for the name of a noted breeder, and for well-known places misprints like "Tarkarbad" and "Uteniquis mountains," does not extend into the less readily checked subject matter of the text. The illustrations, so far as they go, are capital, but might with great advantage have been much more plentiful.

With these few reservations, and with much genuine approval, we may confidently commend this instructive work to the flockmasters present and prospective in Rhodesia.

E.A.N.

## Veterinary Report.

November, 1913.

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### SALISBURY.

AFRICAN COAST FEVER.—One cow was destroyed at the Hatfield infected centre.

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### BULAWAYO.

AFRICAN COAST FEVER.—No fresh developments.

TUBERCULOSIS.—A case of this disease was discovered on a farm in Nyamandhlovu district. *Post-mortem* examination revealed gross lesions of tuberculosis. Of 57 animals in contact, 52 were tested with tuberculin, and three re-acted. The latter and five untested were placed in quarantine.

MALLEIN TEST.—The following imported animals were tested, with negative results (includes animals *ex* Transvaal tested at West Nicholson):—Horses, 25; mules, 28; donkeys, 247.

TUBERCULIN TEST.—Nine bulls imported from England were tested, with negative results.

IMPORTATIONS.—Bulls, 71 Colonial and 25 English; heifers, 190 Colonial and 24 English; sheep and goats, 5,818; pigs, 5; ostriches, 122. Nine over-age heifers were slaughtered.

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### UMTALI.

AFRICAN COAST FEVER.—*Existing Outbreaks.*—At N'odzi one beast was destroyed during the month, against nine during



the previous month. At Mabonda and the Jelf Estate there were no suspected cases during the month.

QUARTER EVIL.—No further case on the infected farm Devonshire.

IMPORTATIONS.—Eight head of slaughter cattle from Macequece.

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### VICTORIA.

MALLEIN TEST.—The following animals *ex* Transvaal were tested, with negative results:—8 horses, 4 mules, and 5 donkeys.

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All other districts reported free from infective disease.

J. M. SINCLAIR,  
Chief Veterinary Surgeon.

## Veterinary Report.

December, 1913.

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### SALISBURY.

AFRICAN COAST FEVER.—At the Hatfield Estate infected area the remaining cattle were slaughtered. At the other infected centres, viz., the Commonage and the farms The Grange and Hayden, there were no suspected cases.

TUBERCULIN TEST.—One bull from England tested, with negative results.

REDWATER AND GALL-SICKNESS.—Of the animals inoculated in October, four bulls and one heifer died from anaplasmosis (gall-sickness). A large number of cases of both diseases were reported. These were mostly in imported Colonial stock.

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### BULAWAYO.

AFRICAN COAST FEVER.—No fresh cases at the only centre of infection in Matabeleland, viz., Collaton.

TUBERCULIN TEST.—Thirty-six cattle imported from England by the De Beers Co. were tested, with negative results.

TUBERCULOSIS.—The animals quarantined the previous month were tested, and four gave positive re-actions; three of these had previously given positive re-actions. Two were destroyed, and *post-mortem* examination shewed the existence of extensive lesions of tuberculosis. The remaining two await destruction.

HORSE-SICKNESS INOCULATION.—Four mules inoculated without mortality.

MALLEIN TEST.—The following animals were tested on importation, with negative results (includes West Nicholson):—Horses, 19; mules, 92; donkeys, 215.

IMPORTATIONS.—Heifers, 234 Colonial and 12 English; bulls, 44 Colonial and 13 English; sheep and goats, 4,920.

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### UMTALI.

AFRICAN COAST FEVER.—At N'odzi five head of cattle were destroyed during the month, bringing the total mortality up to 121. No suspicious cases at Mabonda or the Jelf Estate.

TUBERCULIN TEST.—Three Friesland bulls imported from East Friesland were tested, with negative results.

IMPORTATIONS.—Twenty head of cattle from Macequece.

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### VICTORIA.

HORSE-SICKNESS INOCULATION.—Eleven mules were inoculated.

MALLEIN TEST.—One horse and one donkey *ex* Transvaal were tested, with negative results.

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### GWELO.

ARSENICAL POISONING.—At Selukwe 26 head of cattle died from poison. In some of the cases analysis shewed that arsenic was the cause.

TUBERCULIN TEST.—One bull and two heifers from England were tested, with negative results.

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All other districts reported free from infective diseases.

J. M. SINCLAIR,

Chief Veterinary Surgeon.



## Garden Calendar.

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By N. L. KAYE-EDDIE.

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### THE FLOWER GARDEN.

*February.*—During this month the flower garden is gradually approaching perfection, and nearly all plants are in bloom. If these are constantly plucked the yield will be increased, and, except where required for seed, all flowers should be removed as they fade, for seeding shortens the life of many plants. All runners and creepers should have constant attention, and be tied up and trained. Dahlias in more exposed positions should be carefully tied to their stakes, as they now become top-heavy with the weight of their blooms. Palms in the house and conservatory will benefit much if occasionally put out in the rain.

*March.*—During this month the garden should be seen at its perfection, and, owing to our rains, requires a great deal of attention in order to keep the soil free from weeds and caking. Drainage should also be looked to, in order to avoid plants being swamped or washed away. Dahlias and carnations should now be in their heaviest bloom, and will require tying up, and the dying blooms should be removed, in order to prolong their flowering period. Plants for winter flowering should be now coming on and planted out.

Cuttings of carnations may now be made, and should be picked from the choicest plants, and taken from stems which have borne the finest blooms. The cuttings should be placed in boxes containing sand, and kept in a moist condition in a warm position sheltered from the winds. These should be ready for planting out in about two months, and bloom in

three. Carnations, verbena, antirrhinum, penstemon, pansy, dianthus, phlox, calliopsis and escholtzia may be sown for early blooming next spring.

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### THE VEGETABLE GARDEN.

*February.*—Potatoes should receive attention and be carefully ridged up, and care taken that the stalks are not buried. Seeds for winter crops should be sown, such as beet, Brussels sprouts, cabbage, carrots, beans, peas, onions, turnips, tomatoes, etc. Vegetables planted out during this month might be placed a little closer together than usual, as watering may have to be resorted to before they mature.

*March.*—Tomatoes, peas and beans should be in full bearing, and should be staked and tied. Weeding and cultivation should be extensively carried out. Seeds for late winter crops—beans, cabbage, cauliflower, peas, radish, turnips, spinach and beet—should be sown.

## Market Reports.

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The produce markets at Bulawayo and Salisbury are well supplied with all lines. There is a glut of maize, potatoes and onions at Salisbury, but the quality of the tubers is not good.

In the live stock market there is a good steady demand for breeding stock, but there is little enquiry at present for trek oxen. Mules are in demand, but donkeys are very difficult to sell.

The following prices were realised at the Marandellas Trading Company's December sale:—Mashona cows, from £6 to £9 10s.; Colonial heifers, £10; trek oxen, from £6 to £9; bulls, from £9 to £13; fat slaughter oxen, from £6 5s. to £12 10s.; slaughter cows, from £6 5s. to £8 5s.; good local half-bred cows, £16 15s. There was a lot of good stock for sale, but the attendance was poor, local farmers being busy with their tobacco planting. A few horses and mules exchanged hands at low figures.

Messrs. Boggie & Co. held their regular Christmas cattle sale on Wednesday and Thursday, 17th and 18th December, when about 700 head of cattle were put up for sale. The cattle in the market were of a more superior class than usual, there being quite a number of Friesland heifers and some good Africander and graded Shorthorn bulls. Slaughter stock, as usual, were in good demand, but trek oxen were not much sought after. There was keen competition for all good looking dairy cattle and pure-bred bulls of almost any class. Mashona cows, of which there were only a limited number, made a slight advance in price over last sales. The highest price paid for slaughter stock was £11 10s., which probably averaged about 50s. per 100 lbs. A specially fine lot of Friesland heifers produced keen bidding, the top price being realised for one which had calved the day before the sale, the buyer procuring it at £30. The remainder realised from £21 15s. to £25. Cross-bred heifers sold from £10 to £15. The average price of trained oxen was £9 17s. 6d.; these were Colonial or half-bred



animals. Heifer calves realised from £3 to £5, and bull calves £2 12s. 6d. There was no demand for horses or mules, and a number of donkeys were sold for £5 5s. Turkeys realised from 15s. to 17s.; good fowls 4s. each. Many buyers were on the look out for dairy cows, but the number brought to the market was very limited. Two or three fairly good milkers were sold at from £18 to £20. The sale realised between £2,000 and £3,000.

The Fat Stock Show and Sale, held by Messrs. Whitfield & Co. at Salisbury on the 20th December, was a great success, and we are pleased to learn that it is the intention to hold a similar show next year. The champion beast of the show was exhibited by Mr. Partridge. The animal was a half-bred Aberdeen Angus bullock from an imported bull out of an Angoni cow. Killed and dressed, he weighed 650 lbs. The cup presented by the butchers of Salisbury for the best pair of slaughter beasts in the show was also won by Mr. Partridge with the above and a heifer got by a half-bred Shorthorn bull out of a native cow. The heifer killed at 530 lbs. and the pair were sold for £31.

A native ox owned by Mr. Wilkie was bought by Mr. Partridge for £21. The beast scaled 600 lbs. Messrs. Dimmock & Zimmerman sent in a pen of four nice half-bred bullocks and heifers, which sold for £42. A pen of half-bred lambs, about four months old, bred and owned by Mr. J. J. Black, sold for 37s. 6d. each. Mr. Partridge won the silver cup presented by the Mayor for the best pen of slaughter sheep in the show. The gold medal presented by Mr. F. Biller for the best fat turkey was won by Mrs. Newman, of Mt. Hampden. The bird weighed 24½ lbs., and was sold for £3 2s. 6d.

| Article.                        | Johannesburg. |      | Kimberley. |      | Bulawayo. |      | Salisbury. |      |
|---------------------------------|---------------|------|------------|------|-----------|------|------------|------|
| Barley, 150 lbs. -              | 10/6          | 12/6 | 10/0       | 11/0 | —         | —    | 22/6       | 30/0 |
| Beans, 203 lbs. -               | 15/9          | 32/6 | 19/0       | 21/0 | —         | —    | 25/0       | 35/0 |
| Boer Meal, unsifted, 200 lbs. - | —             | —    | 25/0       | 26/0 | 41/0      | 42/0 | 37/6       | 40/0 |
| Bran, wheaten, 100 lbs. -       | 6/6           | 7/3  | 6/0        | 6/3  | 12/0      | 13/0 | 16/0       | —    |
| Flour, 100 lbs. -               | —             | —    | —          | —    | 25/6      | 26/0 | 20/0       | 22/6 |
| „ Colonial, 100 lbs. -          | —             | —    | 14/9       | 15/3 | 23/6      | 24/0 | —          | —    |
| Forage, 100 lbs. -              | 5/0           | 6/0  | 4/0        | 5/6  | 10/0      | 11/0 | 6/0        | 7/0  |
| „ Colonial Oat -                | —             | —    | —          | —    | —         | —    | —          | —    |
| Hay -                           | Bale.         |      | —          | —    | Ton.      |      | Ton.       |      |
| Kaffir Corn, 200 lbs. -         | 12/9          | 13/9 | 13/6       | 14/6 | 60/0      | 65/0 | 30/0       | 40/0 |
| Manna, 100 lbs. -               | 3/0           | —    | —          | —    | 17/0      | 18/0 | 15/0       | 16/0 |
| Mealies, S.A. White, 203 lbs. - | 8/0           | 9/3  | 11/0       | 12/0 | 13/0      | 14/0 | 9/0        | 9/6  |
| Mealies, Yellow, 203 lbs. -     | 8/6           | 9/6  | 10/6       | 11/0 | 12/0      | 13/0 | none       | —    |
| Mealie Meal, White, 183 lbs. -  | —             | —    | 11/6       | 12/0 | —         | —    | 10/6       | 11/0 |
| Munga, 200 lbs. -               | —             | —    | —          | —    | —         | —    | 16/0       | 17/0 |
| Monkey Nuts, bag -              | —             | —    | —          | —    | 12/6      | 13/6 | 8/6        | 9/0  |
| Oats, 150 lbs. -                | —             | —    | 19/0       | 21/0 | —         | —    | 22/0       | 24/0 |
| Onions, 120 lbs. -              | 5/6           | 8/6  | 7/0        | 8/6  | —         | —    | 17/6       | 20/0 |
| Peas, 200 lbs. -                | 17/6          | 19/6 | —          | —    | —         | —    | —          | —    |
| Potatoes, new, 150 lbs. -       | 13/6          | 16/0 | 10/6       | 12/6 | 16/0      | 18/0 | 8/6        | 9/0  |
| „ old, 150 lbs. -               | 6/0           | 13/0 | 5/6        | 9/6  | —         | —    | —          | —    |
| Rapoko -                        | —             | —    | —          | —    | —         | —    | 11/6       | 12/0 |
| Rye, 200 lbs. -                 | —             | —    | —          | —    | —         | —    | —          | —    |
| Salt, 200 lbs. -                | —             | —    | —          | —    | 10/0      | 11/0 | 12/6       | 13/0 |
| Wheat, 203 lbs. -               | 19/0          | 21/0 | 21/0       | 22/0 | —         | —    | 27/6       | 29/0 |
| Butter, local, per lb. -        | 11d.          | 1/2  | 9d.        | 1/4  | —         | —    | 1/6        | 2/0  |
| Eggs, local, per dozen -        | 1/0           | 2/6  | 9d.        | 1/4  | —         | —    | 2/3        | 3/0  |
| Ducks, each -                   | 2/9           | 3/3  | 2/9        | 3/3  | —         | —    | 3/0        | 4/0  |
| Fowls, each -                   | 1/11          | 2/10 | 1/0        | 2/3  | —         | —    | 2/6        | 3/6  |
| Geese, each -                   | 3/0           | 4/0  | 3/3        | 4/3  | —         | —    | 7/0        | 9/0  |
| Turkeys, cocks, each -          | 10/6          | 16/6 | 9/6        | 11/6 | —         | —    | 12/6       | 15/0 |

## LIVE STOCK.

|                              |   |      |       |       |        |        |
|------------------------------|---|------|-------|-------|--------|--------|
| Slaughter Cattle, 100 lbs. - | — | —    | —     | —     | 40/0   | —      |
| Trek Oxen, trained -         | — | £8   | £10   | —     | £10    | £11/10 |
| Local Cows, milk -           | — | —    | —     | —     | —      | —      |
| Dairy Cows -                 | — | —    | —     | —     | £25    | £27/10 |
| Native Cows -                | — | —    | —     | —     | £8/10  | £10    |
| Heifers, Colonial -          | — | —    | —     | —     | £9     | £10/10 |
| „ Native -                   | — | —    | —     | —     | £7     | £8     |
| Pigs, live weight -          | — | 3½d. | 3d.   | 4d.   | 4d.    | —      |
| Horses, riding, salted -     | — | —    | —     | —     | £35    | £40    |
| „ „ unsalted -               | — | £10  | £25   | —     | £22    | £30    |
| Mules, inoculated -          | — | £18  | £25   | —     | £25    | £27/10 |
| Donkeys, geldings -          | — | —    | £5    | £7    | £8/10  | £6     |
| „ mares -                    | — | £6   | £7/10 | £8/10 | £10/10 | £7     |
| Goats -                      | — | —    | —     | 12/0  | 14/0   | 12/6   |
| Persian Ewes -               | — | —    | —     | —     | —      | 21/0   |
| Cross-bred Ewes -            | — | —    | —     | —     | —      | 17/0   |
| Sheep, slaughter -           | — | 11/0 | 18/0  | 15/0  | £1     | 22/6   |
|                              |   |      |       |       |        | 25/0   |

# Weather Bureau.

## TEMPERATURES.

| STATION                                | NOVEMBER     |              | DECEMBER     |              |
|--|--------------|--------------|--------------|--------------|
|  | Mean<br>Max. | Mean<br>Min. | Mean<br>Max. | Mean<br>Min. |
| MASHONALAND—                           |              |              |              |              |
| Hartley, Gatooma ...                   | 88·5         | 63·6         | 96·2         | 65·3         |
| „ Giant Mine ...                       | 86·0         | 63·8         | 94·8         | 64·1         |
| „ Hallingbury Farm ...                 | 87·4         | 60·9         | 94·3         | 61·9         |
| Lomagundi, Eldorado Mine ...           | 90·4         | 65·1         | 95·7         | 67·4         |
| „ Kanyemba ...                         | —            | —            | 102·5        | 77·2         |
| „ Sinoia ...                           | 90·9         | 60·6         | —            | —            |
| „ Sipolilo ...                         | 86·3         | 63·0         | 96·3         | 64·3         |
| Makoni, River Junction ...             | 87·9         | 61·5         | 97·4         | 59·9         |
| Mazoe, Shamva Mine ...                 | 88·9         | 64·8         | 93·0         | 65·7         |
| Melsetter ...                          | 77·7         | 54·5         | 83·8         | 56·2         |
| „ Mount Selinda ...                    | 78·6         | 56·7         | 82·9         | 60·5         |
| „ Vermont ...                          | 80·5         | 59·6         | 84·1         | 60·8         |
| Salisbury, Agricultural Laboratory ... | 83·1         | 57·5         | —            | —            |
| „ Chishawasha ...                      | 85·6         | 58·1         | 86·2         | 58·8         |
| „ The Gaol... ...                      | 88·2         | 57·0         | 92·4         | 58·7         |
| Umtali, Chiconga's Location ...        | 84·8         | 61·2         | 90·5         | 62·2         |
| „ Public School ...                    | 88·2         | 61·5         | 92·4         | 62·7         |
| Victoria ...                           | 83·3         | —            | 90·7         | 66·3         |
| MATABELELAND—                          |              |              |              |              |
| Bulawayo, Essexvale ...                | 85·6         | 63·2         | 92·6         | 66·0         |
| „ Observatory ...                      | 82·6         | 57·5         | 89·3         | 62·6         |
| „ Rhodes Matopo Park... ...            | 96·2         | 60·6         | 97·0         | 66·0         |
| Gwelo, The Gaol ...                    | 85·1         | 59·2         | 90·5         | 61·7         |
| Mangwe, Empandeni ...                  | 89·7         | 57·6         | 97·2         | 79·3         |
| Tuli ...                               | 91·5         | 67·4         | 100·1        | 70·3         |
| Wankie, The Hospital ...               | 95·3         | 69·7         | 101·4        | 72·4         |

## RAINFALL.

| STATION              | Nov. | Dec. |
|----------------------|------|------|
| MASHONALAND :        |      |      |
| Charter—             |      |      |
| Driefontein ...      | 2·67 | 0·99 |
| Enkeldoorn ...       | 3·85 | Nil  |
| Grootfontein ...     | 3·23 | 0·53 |
| Marshbrook ...       | 3·23 | 0·35 |
| The Range ...        | 4·07 | 0·36 |
| Riversdale ...       | 2·18 | 0·45 |
| Umvuma (Railway) ... | 3·88 | —    |



## RAINFALL—(Continued).

| STATION                          | Nov. | Dec. |
|----------------------------------|------|------|
| <b>MASHONALAND—(Continued)</b>   |      |      |
| Hartley—                         |      |      |
| Ardgowan ... ..                  | 2·45 | 1·45 |
| Battlefields (Railway) ... ..    | 2·06 | —    |
| Beatrice Mine ... ..             | 4·50 | —    |
| Carnock Farm ... ..              | 2·04 | 1·86 |
| Daisy ... ..                     | 3·64 | 0·85 |
| Elvington ... ..                 | 4·04 | 1·91 |
| Franceys ... ..                  | 3·17 | 1·45 |
| Gatooma ... ..                   | 3·23 | 2·55 |
| Gatooma (Railway) ... ..         | 3·57 | —    |
| Giant Mine ... ..                | 3·30 | 0·74 |
| Gowerlands ... ..                | 2·29 | 0·66 |
| Hallingbury ... ..               | 1·43 | 0·58 |
| Hartley (Railway) ... ..         | 3·09 | —    |
| Impofhoe ... ..                  | 6·21 | 1·17 |
| “Jenkinstown” ... ..             | 3·15 | 1·31 |
| Makwiro ... ..                   | 2·40 | 2·00 |
| Shagari ... ..                   | 2·23 | 2·08 |
| “Stoneygate” ... ..              | 0·82 | 0·54 |
| Lomagundi—                       |      |      |
| Banket Junction (Railway) ... .. | 0·84 | —    |
| Darwendale ... ..                | 1·61 | —    |
| Duxbury Farm ... ..              | 2·33 | 1·22 |
| Eldorado Mine ... ..             | 1·07 | 1·09 |
| „ (Railway) ... ..               | 0·10 | —    |
| Golden Kopje Mine ... ..         | 2·14 | 2·34 |
| Kanyemba ... ..                  | —    | 2·18 |
| Longmead ... ..                  | 1·42 | 1·11 |
| Palm Tree Farm ... ..            | 1·32 | 3·59 |
| Sinoia ... ..                    | 1·34 | —    |
| Sipolilo ... ..                  | 3·05 | 1·95 |
| Umvukwe Rancho ... ..            | 6·25 | 2·21 |
| Makoni—                          |      |      |
| Chimbi Source ... ..             | 4·65 | 0·77 |
| Eagle's Nest ... ..              | 1·91 | 1·02 |
| Ellavale ... ..                  | 5·90 | 1·78 |
| Inyanga ... ..                   | 3·85 | 1·90 |
| Mona ... ..                      | 4·53 | 0·70 |
| Monte Cassino Mission ... ..     | 2·83 | 1·30 |
| Odzi (Railway) ... ..            | 7·92 | —    |
| River Junction ... ..            | 3·20 | 0·40 |
| Rusape (Railway) ... ..          | 2·83 | —    |
| Springs ... ..                   | 3·39 | 0·60 |
| St. Trias' Hill ... ..           | 3·39 | 0·72 |
| York Farm ... ..                 | 2·41 | 1·95 |
| Mangwendi—                       |      |      |
| Bonongwe ... ..                  | 5·18 | 0·55 |
| Glen Somerset ... ..             | 1·63 | —    |
| Land Settlement Farm ... ..      | 6·36 | 1·08 |
| Macheke (Railway) ... ..         | 2·53 | 1·25 |
| Marandellas ... ..               | —    | 2·97 |

## RAINFALL—(Continued).

| STATION                           |     |     |     | Nov. | Dec. |
|-----------------------------------|-----|-----|-----|------|------|
| MASHONALAND—(Continued)           |     |     |     |      |      |
| Mangwendi (Continued)             |     |     |     |      |      |
| Marandellas (Railway)             | ... | ... | ... | 3·51 | —    |
| Mrewa                             | ... | ... | ... | 2·90 | 0·71 |
| Mungo                             | ... | ... | ... | 6·29 | 0·48 |
| Rusawi Outspan                    | ... | ... | ... | 3·64 | 4·02 |
| Selous Nek                        | ... | ... | ... | 0·65 | 0·76 |
| Tweedjan                          | ... | ... | ... | 5·51 | 3·08 |
| Mazoe—                            |     |     |     |      |      |
| Avonduur                          | ... | ... | ... | 2·58 | 1·16 |
| Bindura                           | ... | ... | ... | 1·42 | 0·79 |
| Bindura (Railway)                 | ... | ... | ... | 2·56 | —    |
| Ceres                             | ... | ... | ... | —    | 1·57 |
| Chipoli                           | ... | ... | ... | 2·35 | 1·48 |
| Claverhill                        | ... | ... | ... | 1·89 | 0·97 |
| Darwin                            | ... | ... | ... | 2·45 | 1·38 |
| Dunmaglas                         | ... | ... | ... | 1·50 | 0·89 |
| Laguaha                           | ... | ... | ... | 0·76 | 1·04 |
| Lowdale                           | ... | ... | ... | 3·04 | 1·79 |
| Mazoe                             | ... | ... | ... | 1·70 | 1·54 |
| Mguta Valley                      | ... | ... | ... | 2·22 | 1·36 |
| Omeath                            | ... | ... | ... | 2·06 | —    |
| Ruia                              | ... | ... | ... | 2·70 | 1·61 |
| Shamva                            | ... | ... | ... | 4·46 | 0·55 |
| „ Mine                            | ... | ... | ... | 2·21 | 0·30 |
| Sunnyside                         | ... | ... | ... | 0·83 | 1·82 |
| Teign                             | ... | ... | ... | 3·26 | 1·31 |
| Umvukwe Flats                     | ... | ... | ... | 3·52 | 1·49 |
| Waterfall Farm                    | ... | ... | ... | 5·00 | —    |
| Melsetter—                        |     |     |     |      |      |
| Chipinga                          | ... | ... | ... | 2·73 | 1·94 |
| Helvetia                          | ... | ... | ... | 8·58 | —    |
| Melsetter                         | ... | ... | ... | 4·61 | 2·80 |
| Mount Selinda                     | ... | ... | ... | 8·64 | 6·00 |
| Mutambara Mission                 | ... | ... | ... | 3·97 | —    |
| Pasture                           | ... | ... | ... | 7·15 | 1·64 |
| Tom's Hope                        | ... | ... | ... | 5·90 | 1·67 |
| Vermont                           | ... | ... | ... | 8·43 | 5·18 |
| Salisbury—                        |     |     |     |      |      |
| Avondale                          | ... | ... | ... | 1·48 | 1·00 |
| Brookmead                         | ... | ... | ... | 1·79 | —    |
| Chishawasha                       | ... | ... | ... | 2·48 | 3·20 |
| Cleveland Reservoir               | ... | ... | ... | 2·73 | 1·33 |
| Convent                           | ... | ... | ... | 1·97 | —    |
| Goromonzi                         | ... | ... | ... | 2·50 | 0·98 |
| Gwibi                             | ... | ... | ... | 4·41 | —    |
| Lilfordia                         | ... | ... | ... | 3·04 | 1·70 |
| Meadows                           | ... | ... | ... | —    | 1·41 |
| Salisbury Agricultural Laboratory | ... | ... | ... | 1·68 | —    |
| „ (Club)                          | ... | ... | ... | 1·55 | 0·84 |
| „ (Gaol)                          | ... | ... | ... | 1·38 | 1·07 |

RAINFALL (*Continued*).

| STATION                 |     |     |     | Nov. | Dec. |
|-------------------------|-----|-----|-----|------|------|
| MASHONALAND—(Continued) |     |     |     |      |      |
| Salisbury (Continued)   |     |     |     |      |      |
| Salisbury (Railway)     | ... | ... | ... | 1·49 | —    |
| Sebastopol              | ... | ... | ... | 3·63 | 1·92 |
| Selby                   | ... | ... | ... | 2·33 | 1·34 |
| Westridge               | ... | ... | ... | 1·45 | 0·74 |
| Umtali—                 |     |     |     |      |      |
| Chiconga's Location     | ... | ... | ... | 4·09 | 1·94 |
| Odzani                  | ... | ... | ... | 3·06 | 2·07 |
| Penhalonga              | ... | ... | ... | 3·68 | —    |
| Premier Estate          | ... | ... | ... | 2·30 | 1·23 |
| Public School           | ... | ... | ... | 4·19 | 0·49 |
| Stralsund               | ... | ... | ... | —    | 1·15 |
| Summerfield             | ... | ... | ... | 3·34 | 0·81 |
| Umtali (Railway)        | ... | ... | ... | 4·02 | —    |
| Victoria—               |     |     |     |      |      |
| Chibi                   | ... | ... | ... | 1·82 | 0·53 |
| Chilimanzi              | ... | ... | ... | 1·98 | —    |
| Chingombe               | ... | ... | ... | 2·44 | 1·23 |
| Chiredzi Rancho, Ndanga | ... | ... | ... | 1·84 | 0·90 |
| Clipsham                | ... | ... | ... | 4·41 | 1·30 |
| Gokomere                | ... | ... | ... | 3·94 | 0·87 |
| Gutu                    | ... | ... | ... | 3·65 | —    |
| Makorsi River Rancho    | ... | ... | ... | 1·54 | 1·16 |
| Marthadale              | ... | ... | ... | 3·01 | 1·12 |
| Morgenster              | ... | ... | ... | 5·89 | 1·83 |
| Noeldale                | ... | ... | ... | 5·80 | 0·73 |
| Pamushana               | ... | ... | ... | 5·57 | 0·39 |
| Silver Oaks             | ... | ... | ... | 4·52 | 1·33 |
| Victoria                | ... | ... | ... | 4·17 | 0·75 |
| MATABELELAND :          |     |     |     |      |      |
| Belingwe—               |     |     |     |      |      |
| Anglo-French Block      | ... | ... | ... | 0·74 | —    |
| Filabusi                | ... | ... | ... | 1·13 | 1·96 |
| Fort Rixon              | ... | ... | ... | 1·70 | 0·23 |
| Infiningwe              | ... | ... | ... | 1·13 | 1·00 |
| Insiza (Railway)        | ... | ... | ... | 2·12 | —    |
| Shangani (Railway)      | ... | ... | ... | 1·58 | —    |
| Tamba                   | ... | ... | ... | 2·11 | —    |
| Thornville              | ... | ... | ... | 1·81 | 0·96 |
| Bubi—                   |     |     |     |      |      |
| Inyati                  | ... | ... | ... | 2·18 | 1·31 |
| Leighton                | ... | ... | ... | 5·18 | 0·77 |
| Lochard Experiment Farm | ... | ... | ... | 2·54 | 1·68 |
| Bulalima—               |     |     |     |      |      |
| Figtree                 | ... | ... | ... | 2·57 | 1·01 |
| Mholi (late Magot)      | ... | ... | ... | 1·99 | 2·41 |
| Marula                  | ... | ... | ... | 2·03 | 2·45 |
| Solusi                  | ... | ... | ... | 2·45 | 0·63 |
| Syringa                 | ... | ... | ... | 1·36 | 1·47 |



RAINFALL (*Continued*).

| STATION                     |     |     | Nov. | Dec. |
|-----------------------------|-----|-----|------|------|
| MATABELELAND—(Continued)    |     |     |      |      |
| Bulawayo—                   |     |     |      |      |
| Balla Balla (Railway)       | ... | ... | 2·45 | —    |
| Bembesi (Railway)           | ... | ... | 4·17 | —    |
| Braemar                     | ... | ... | 2·93 | 1·08 |
| Essexvale                   | ... | ... | 0·90 | 1·01 |
| Gwaai (Railway)             | ... | ... | 3·43 | —    |
| Heany Junction (Railway)    | ... | ... | 3·36 | —    |
| Hope Fountain               | ... | ... | 2·30 | 2·66 |
| Imbesu Kraal                | ... | ... | 2·84 | 0·93 |
| Keendale                    | ... | ... | 2·18 | 1·70 |
| Khami                       | ... | ... | 1·35 | 2·08 |
| Lower Rangemore             | ... | ... | 2·22 | 2·06 |
| Matopo Mission              | ... | ... | 1·71 | 2·92 |
| Maxim Hill                  | ... | ... | 8·26 | 0·32 |
| Melinakanda Junction        | ... | ... | 3·43 | 0·58 |
| Nyamandhlovu (Railway)      | ... | ... | 2·15 | —    |
| Observatory                 | ... | ... | 3·21 | 0·99 |
| Pendennis                   | ... | ... | 3·38 | 1·46 |
| Raylton                     | ... | ... | 2·43 | —    |
| Rhodes Matopo Park          | ... | ... | 1·78 | 0·82 |
| Umgusa                      | ... | ... | 5·52 | 0·63 |
| Umkien                      | ... | ... | 1·42 | 0·10 |
| Gwanda—                     |     |     |      |      |
| Antelope Mine               | ... | ... | 3·59 | 0·83 |
| Gwanda (Gaol)               | ... | ... | 5·00 | 1·85 |
| „ (Railway)                 | ... | ... | 5·07 | —    |
| Malundi                     | ... | ... | 1·89 | 0·25 |
| Mtshabzi Mission            | ... | ... | 2·54 | 3·10 |
| West Nicholson (Railway)    | ... | ... | 2·83 | —    |
| Gwelo—                      |     |     |      |      |
| Globe and Phoenix (Railway) | ... | ... | 2·29 | —    |
| Gwelo (Gaol)                | ... | ... | 2·84 | 1·44 |
| Gwelo (Railway)             | ... | ... | 2·77 | —    |
| Lalapanzi                   | ... | ... | 2·72 | —    |
| Lochiel                     | ... | ... | 3·55 | 3·42 |
| Lower Gwelo                 | ... | ... | 2·12 | 1·31 |
| Que Que                     | ... | ... | 1·46 | 0·52 |
| Rhodesdale Estate           | ... | ... | 1·75 | 0·45 |
| Selukwe (Railway)           | ... | ... | 5·02 | —    |
| Shawlands                   | ... | ... | —    | 3·36 |
| Sheltered Vale              | ... | ... | 2·50 | 1·49 |
| Sikombela                   | ... | ... | 0·56 | —    |
| Mafungabusi—                |     |     |      |      |
| Inyoka                      | ... | ... | 4·04 | 0·27 |
| Mangwe—                     |     |     |      |      |
| Empandeni                   | ... | ... | 1·48 | 1·82 |
| Garth                       | ... | ... | 1·81 | 1·53 |
| Tuli—                       |     |     |      |      |
| Lamulas                     | ... | ... | 1·95 | —    |

RAINFALL (*Continued*)

| STATION                  |     |     |     | Nov. | Dec. |
|--------------------------|-----|-----|-----|------|------|
| MATABELELAND—(Continued) |     |     |     |      |      |
| Tuli (Continued)         |     |     |     |      |      |
| Langalanga               | ... | ... | ... | 3·15 | —    |
| Makalali                 | ... | ... | ... | 3·24 | —    |
| Manantji                 | ... | ... | ... | 3·01 | —    |
| Manyoni                  | ... | ... | ... | 0·67 | —    |
| Mazunga                  | ... | ... | ... | 1·22 | —    |
| Tuli                     | ... | ... | ... | 2·07 | 3·71 |
| Wankies—                 |     |     |     |      |      |
| Malindi (Railway)        | ... | ... | ... | 1·80 | —    |
| Victoria Falls           | ... | ... | ... | 1·53 | 1·21 |
| Victoria Falls (Railway) | ... | ... | ... | 2·41 | —    |
| Wankies Hospital         | ... | ... | ... | 2·47 | 0·74 |
| Wankies (Railway)        | ... | ... | ... | 1·81 | —    |

— No return.

# Dates of Meetings of Farmers' Associations, Southern Rhodesia

(SUBJECT TO ALTERATION)

DATES OF MEETINGS OF FARMERS' ASSOCIATIONS.

469

| Name of Association              | Place of Meeting            | Secretary                           | 1914 |             |       |
|----------------------------------|-----------------------------|-------------------------------------|------|-------------|-------|
|                                  |                             |                                     | Feb. | Mar.        | April |
| Bindura                          | Thurlow's Hotel             | A. M. Robb                          | ..   | 14          | ..    |
| Charter-Magvi                    | Beatrice Mine               | W. Krienke                          | ..   | 25          | ..    |
| Central                          | Unvuma..                    | N. Dainty                           | 27   | 27          | 24    |
| Enterprise                       | Arcturus Hotel              | J. Watson                           | 10   | 10          | 14    |
| Figtree Branch, R.L. and F.A.    | Figtree Hotel               | A. Curtis                           | 7    | ..          | ..    |
| Gatooma                          | Gatooma                     | ..                                  | 21   | 21          | 18    |
| Gazaland                         | Court House, Chippinga      | W. Wood                             | ..   | ..          | 30    |
| Greystone                        | Roodeheuveel, Shangani      | J. W. Spencer                       | 14   | 14          | 11    |
| Hartley                          | Hartley                     | H. Savory                           | 7    | 7           | 11    |
| Headlands                        | Headlands                   | H. Barnes Pope                      | 28   | ..          | ..    |
| Insiza                           | Insiza Hotel                | N. C. St. J. Breslin                | ..   | 7           | ..    |
| Lalapanzi                        | Lalapanzi Hotel             | B. Smit                             | ..   | ..          | ..    |
| Lomagundi                        | Sinoia                      | J. N. Bateman                       | ..   | 21          | ..    |
| Macheke                          | Macheke                     | H. H. Kidson                        | 7    | ..          | ..    |
| Makwiro                          | Makwiro                     | A. B. Fraser                        | ..   | ..          | ..    |
| Marandellas                      | Marandellas Farmers' Hall   | E. P. de Kock                       | 7    | 7           | 4     |
| Mangwendi                        | Fixed every meeting         | ..                                  | ..   | ..          | ..    |
| Marula                           | Marula Siding               | MacW. Ingram                        | 28   | 28          | 25    |
| Mashonaland                      | Commercial Hotel, Salisbury | W. H. Williamson                    | 14   | 14          | 11    |
| Matopo Branch, R.L. and F.A.     | Malundi Hotel               | W. Bathurst                         | ..   | ..          | 8     |
| Mazoe                            | Various Farm Houses         | F. C. Peek                          | ..   | 11          | ..    |
| Melsetter (North)                | Various Farm Houses         | Rev. R. Wodehouse & S. J. M. Marais | ..   | ..          | ..    |
| Midlands                         | Gwelo                       | M. L. Price                         | ..   | ..          | ..    |
| Northern                         | Farm "Summerfield"          | R. O. H. Blurton                    | ..   | ..          | 4     |
| Phuntree                         | Phuntree                    | H. Brooke                           | 14   | 14          | 11    |
| Que Que                          | Globe and Phoenix Hotel     | E. E. Somerset                      | 21   | 21          | 18    |
| Rhodesian Landowners and Farmers | Library Buildings, Bulawayo | H. S. Hopkins                       | 27   | 27          | 24    |
| Shanva                           | Shamva                      | J. M. Moubray                       | No   | dates fixed | 5     |
| Southern                         | Peggy Hotel, Insiza         | W. J. B. Harris                     | 1    | 1           | ..    |
| Selukwe                          | Selukwe Hotel               | F. S. Clark                         | No   | dates fixed | 4     |
| Somabula and Shangani Flats      | Fairview                    | S. Annandale                        | 7    | 7           | 4     |
| Umvukwe                          | Victoria                    | Hon. J. S. Parker                   | 7    | ..          | ..    |
| Victoria                         | Christmas Pass Hotel        | J. Rutherford                       | 7    | 7           | 4     |
| Umtali                           | ..                          | J. S. Holland                       | ..   | ..          | 4     |



## Departmental Notices.

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### Information for Farmers

The Department of Agriculture is prepared to furnish to farmers technical advice either by correspondence, or, where possible, by personal visits. All communications should be addressed in the first instance to the Director of Agriculture.

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### Crops

The Agricultural Branch deals with enquiries relating to agricultural practice, soils, crops, cultural operations, processes, seeds, trees, farm implements and machinery, etc.

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### Poisonous Plants

It is of great importance that as soon as possible a study should be made of those plants found in Southern Rhodesia which are poisonous or deleterious to small or large stock. Farmers and others who have known, or suspected poisonous plants on their property, are requested to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, at the same time forwarding specimens of the plant, including stem, leaves, flowers, and, where possible, fruit. Any particular regarding the habits of the plant will be welcomed, and in return the Department will supply all available information regarding the plants.

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### Disposal of Seeds

All farmers and others who have surplus supplies of good quality locally grown farm seed of any description are invited to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, stating what

quantities are available for sale, and price f.o.r. nearest station. In all cases representative samples of the grain must accompany the letter, but need not exceed two ounces in weight.

The Agricultural Department is continually receiving enquiries as to where various seeds can be obtained, and it is hoped that by the above means growers of reliable seed may be brought into touch with one another.

It must be clearly understood, however, that beyond recommending sources of supply, the Department cannot take any further part in the transaction.

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### **Tobacco**

The services of the Tobacco Expert are available to all desiring advice on the subject. Applications should be accompanied by particulars of the nature of the information sought, also the distance and direction of the farm from some well known centre.

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### **Live Stock**

The Animal Industry Branch is prepared to advise with regard to all matters connected with stock breeding, selection feeding and registration of stud animals, the dairy industry, poultry management, farm buildings for stock, and kindred subjects. Buyers and sellers of stud stock in Rhodesia are also put in touch with one another.

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### **Purchase of Stock in the South African Union on behalf of Farmers resident in Southern Rhodesia.**

The following amended arrangements are published for general information.

The Government undertakes the purchase of pure-bred live stock for farmers on the following terms and conditions.

Applications must be made on the prescribed Form "A," and all conditions complied with before same is registered. Applications will be considered in rotation, but fulfilled as

opportunity serves, so that animals may be procured as cheaply as possible.

A deposit of £1 per head for cattle, horses or donkeys, and 5s. per head for sheep, goats, pigs or fowls shall be made at the time of application.

The amount of the estimated cost of the stock in excess of £200 must be paid at the time of application, but payment may be made by instalments for amounts not exceeding this sum in the following manner.

One-third of the total cost of the stock, including railage and incidental expenses, and less the deposit made with order, shall be paid on delivery of the stock, and the balance of the cost with interest thereon at the rate of 6 per cent. per annum shall be paid in two equal amounts in six and twelve months from date of delivery: promissory notes shall be made and given by the applicant for such amounts for the respective periods. The issue of such promissory notes shall not, however, debar claims for adjustment of differences in respect of either under-payments or over-payments due to errors or omissions.

Failing the payment of any instalment on due date, the whole of the unpaid balance of the cost of the said stock, including railage and incidental expenses, with interest thereon at the rate of 10 per cent. per annum, shall immediately become due and payable.

Until the final instalment has been paid the said stock shall remain the property of the Government, and shall not be disposed of without the consent of the Director of Agriculture.

The applicant shall take delivery of the stock allotted to him. Whilst every endeavour will be made by the Government to ensure satisfaction regarding the stock purchased, every animal shall be taken and accepted with all defects, and no warranty regarding same is expressed or implied.

The Department does not undertake to purchase stock at precisely the prices specified by the applicant, but will endeavour to approximate as nearly as possible and not to exceed same by over 20 per cent.

The authorised representative of the Department will be allowed a reasonable commission, with expenses additional, which will be included in the cost of the stock.



The Government will meet all losses up to the time of arrival of the stock at the place of delivery indicated by the applicant, after which the stock shall be entirely at his risk. The applicant or his agent will be advised regarding the arrival of his stock.

The Government reserves the right to decline at any time to undertake or complete purchases without assigning reasons for so doing.

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## Entomology

The Government Entomologist advises on matters connected with insect pests of live stock, crops, and fruit trees, and also undertakes the inspection of nurseries and of the importation of plants from abroad.

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## Chemical Analyses

The Government Agricultural Chemist deals with matters relating to the composition of soils, fertilisers, farm produce of vegetable or animal origin; also the investigation of poisons and of articles of potential economic value.

Nominal charges are made, which, while not covering the cost, will help to defray the expense and serve as a proof of good faith. Samples, carriage prepaid, together with full particulars regarding the subject should be addressed to the Agricultural Chemist, Department of Agriculture, Salisbury.

A schedule of charges and directions for taking samples will be furnished on application.

With all analyses, reports will be furnished explanatory of the results and, when possible, advice given as to the nature, properties and value of the material.

No charge will be made for analysis where the material forwarded is considered by the Director of Agriculture and Chemist to be of sufficient general interest.

## Services of Government Veterinary Surgeons

1. The services of Government Veterinary Surgeons are available to the public, free of charge, for the following purposes only :—

- (1) Attending and giving professional advice in connection with the following diseases, viz. :—Anthrax, Contagious abortion, East Coast Fever, Epizootic Lymphangitis, Foot and Mouth Disease, Farcy, Foot-rot, Heartwater, Glanders, Intestinal parasites amongst sheep and goats, Liver Disease, Lungsickness, Osteo Porosis, Malarial Catarrhal Fever (blue tongue), Rabies, Redwater, Rinderpest, Scabies, Sponziecte (quarter evil), Swine Fever, and any other diseases which may in future be scheduled in terms of section 3, sub-section 18 of the "Animals Diseases Consolidation Ordinance, 1906." Attending to cases of disease amongst live stock which, though not of a contagious or infectious character, may be of general public importance.
- (2) Applying tests in regard to Glanders, Tuberculosis, or any other disease against the introduction or spread of which tests are applied under regulations.
- (3) Inoculations against the following diseases :—  
Horsesickness, Lungsickness, Anthrax, Quarter Evil, Redwater, Malarial Catarrhal Fever (blue tongue). A fee to cover the cost of serum and virus will be charged.

2. The following charges shall be made and payable for services rendered by the Government Veterinary Surgeons in other cases, viz. :—

|   | £ | s. | d. |
|---|---|----|----|
| (1) For every professional visit within three miles of his office or residence ... ..                 | 0 | 5  | 0  |
| (2) For every professional visit beyond such distance ... ..  | 0 | 10 | 6  |
| plus an additional charge of 2/6 per hour whilst engaged in such visits or £2/2/0 a day of 24 hours ; |   |    |    |

|   | £ | s. | d |
|---|---|----|---|
| (3) For advice given at the Veterinary Surgeon's office, for each animal, per visit | 0 | 2  | 6 |
| (4) The following to be charged in addition to visiting fees:—                      |   |    |   |
| a. For every examination as to soundness, each ... ..                               | 1 | 1  | 0 |
| b. For castration, horses, each ... ..  | 1 | 1  | 0 |
| c. For castration, bulls, each ....   | 0 | 5  | 0 |
| d. For castration, donkeys, each.. ...  | 0 | 10 | 6 |
| e. For parturition cases, mares, each   | 2 | 2  | 0 |
| f. For parturition cases, cows, each..  | 1 | 1  | 0 |
| g. For other operations, according to nature, from 5/- to £2/2/0.                   |   |    |   |

3. Double the above fees will be payable for services rendered on Sundays, public holidays, and between the hours of 7 p.m. and 7 a.m.

4. Applicants for the services of Government Veterinary Surgeons must at their own cost provide the necessary transport for the conveyance of these officers from, and back to, their residence or nearest railway station.

5. Farmers and owners of stock throughout the country frequently telegraph for a Government Veterinary Surgeon to be sent to attend an animal which has been taken seriously ill. It is rarely possible to comply with these requests at once, as the Veterinary Surgeon may be engaged on duty which he cannot leave, or is at such a distance from where his services are required that he can hardly be expected to arrive in time to be of any service in an urgent case. Hence much valuable time is wasted, the owner of the animal is dissatisfied, and the veterinary staff discredited. To obviate this, in all cases where veterinary advice and assistance are required, the owner should telegraph to "Veteran," Salisbury, with prepaid reply, the nature of the complaint that the animal is suffering from, giving as full and accurate a description of the symptoms as possible. This will enable the Chief Veterinary Surgeon to telegraph advice at once and state whether he is able to arrange for veterinary attendance on the case or not, and save valuable time, which is always of importance in acute cases.



6. The services of Government Veterinary Surgeons will only be available for private work with the consent of such officers, and when such work does not interfere with their official duties, or when the services of a private practitioner are not available.

7. As the arrangement of allowing Government Veterinary Surgeons to attend to private cases is intended purely for the benefit of farmers and stock-owners who may wish to obtain professional advice, no responsibility whatever will be accepted for any loss of stock, etc., which may result from the negligent treatment or advice, or wilful default, of any Government Veterinary Surgeon.

8. All fees collected in terms of these Regulations are payable to the Treasury through the local Receiver of Revenue.

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### Sale of Dip

With a view to enabling farmers to obtain dipping material at as low a rate as possible arrangements have been made whereby orders may be placed with any officer of the Veterinary Department for the purchase of supplies of Messrs. W. Cooper & Nephew's cattle dipping fluid, adapted for three-day, five-day or less frequent dipping. The price of the dip is 48s. 6d. per 10 gals., in not less quantities than that amount, delivered at any siding or station desired, in 5 gal. drums. Applications must be accompanied by remittances, without which they cannot receive attention. Remittances by cheque should be made in favour of Messrs. Meikle Bros., agents for the dipping fluid, commission being added, where necessary, to cover exchange. Coin or stamps will not be accepted. This dip is in use at all Government dipping tanks.

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### Sale of Virus

It is notified for public information that redwater and gall-sickness (*anaplasmosis*) virus may be obtained from the Veterinary Department, Salisbury, at a charge of ten shillings per dose.

Solutions of trypan blue and the injection used in the treatment of *trypanosomiasis* (fly disease) of cattle may also be

obtained at a charge of five shillings per dose and blue tongue virus at one shilling and sixpence per dozen doses.

No material will be issued unless a remittance accompanies the order.

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### Irrigation

From the Agricultural Engineer assistance may be obtained by farmers for the following :—

1. In the locating of possible irrigation projects.
2. In the preparation of surveys or plans and for irrigation works, including weirs, dams, furrows, pumping plants, and determining the extent of land which may be brought under irrigation schemes, together with rough estimates of costs.
3. In the supervision of construction and carrying out of projects.
4. In the selection of suitable sites for boring operations.
5. Preparing specifications, etc., regarding pumping plants, windmills, and agricultural machinery.
6. Giving general advice on cognate subjects.

Informal advice of a general character will be given to applicants making enquiry by letter or in person. Any applicant desiring professional assistance likely to occupy more than one day should apply for advice in writing. All applicants should specify clearly the nature of the project on which they seek advice, and should give full particulars as to the distance and direction of their farms from some well-known centre. Applicants will be required to provide suitable means of transport for the officer concerned during the period devoted to work on the spot; to provide any unskilled labour that may be required; and to provide for any other contingent services. Applications should be addressed to the Director of Agriculture, who will endeavour to arrange visits as far as possible in order of application, but with due regard to situation, in order to obviate unnecessary travelling and delay. The services of the Agricultural Engineer are given free, but in cases demanding prolonged individual attention, or repeated supervision, a charge may be made according to circumstances.

## Samples

In connection with enquiries, especially with regard to diseases amongst crops, insect pests, soils, grain and the identification of plants, specimens should, wherever possible, be sent, together with full details. It is found that such parcels are often forwarded without any indication of where they are from or why they were sent and it is difficult in such cases to trace the sender. It is, therefore, requested that persons when forwarding samples for examination, indicate clearly their names and address on the package, so as to enable their requirements to be attended to without delay.

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## Charges for Dipping Cattle at Government Dipping Tanks.

A charge of 1d. per head is made in respect of all cattle dipped at Government dipping tanks.

Unweaned calves will be dipped free of charge.

Payment may be made in cash or by means of books of coupons at £1, 10/- and 2/6, which can be obtained from Civil Commissioners, Native Commissioners, or through all Veterinary Surgeons and Cattle Inspectors.

The tanks to which these provisions at present apply are the following :—

Salisbury (3), Bulawayo (3), Inyati, Umtali, Penhalonga, Melsetter, Marandellas, Macheke, Mazoe, Lomagundi, Hartley, Gwelo, Selukwe, Enkeldoorn, Victoria, Gwanda, Gatooma, Que Que, Umvuma, Kimberley Reefs.

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## Lectures for Farmers

The services of certain of the officers of the Department of Agriculture and the Veterinary Department are available for purposes of delivering lectures on subjects upon which they have special knowledge. As far as practicable, lectures will be accompanied by demonstrations at the time or subsequently in the field. Owing to the many calls on the time of the staff and the exigencies of their duties, alternative dates are desirable in order to avoid disappointment. The following topics are



offered as examples of subjects that may be dealt with in this manner, but the suggestion of other themes is invited.

*Agriculture.*—Maize growing; Maize selection and maintenance of the breeding plot; Points of maize and maize judging, with demonstrations; Utilisation of granite vlei soils; Ground nut culture; Rotation crops for home use and for sale; Veld improvement by winter grasses; Production of foodstuffs for the mines; Ensilage; Fungoid diseases of maize and wheat; Wheat, oats and lucerne under irrigation; The prospects of cotton culture in Southern Rhodesia.

*Veterinary Hygiene.*—Detection and prevention of disease; The care of live stock.

*Live Stock.*—Judging of cattle according to breeds, and for beef, milk and draught; feeding and kraaling of live stock; general principles of cattle breeding; management of imported stock; grading up of native or local stock with pure bred bulls.

*Dairying.*—Home butter-making; building and equipment of a farm dairy; handling and marketing of milk; packing and marketing of butter; construction of cow houses.

*Swine Husbandry.*—Breeding and feeding of swine; some suggestions for the production of first-class bacon pigs; construction of piggeries at moderate cost.

*Chemistry.*—The principles of soil fertility; the principles of manuring; the value of lime in agriculture; chemistry of milk and its products (accompanied by demonstrations in milk-testing).

*Entomology.*—Economic entomology on the farm; the role of insects and their allies in the transmission of disease; scale insects and fruit trees and methods for their control; insect pests and maize; enemies of the potato, insect and fungus; the value and objects of plant import and nursery regulations.

*Irrigation.*—Methods of applying water to land for irrigation; the measurement of water in connection with irrigation; canal irrigation; storage reservoirs; hints on the selection of sites and on the design of earthen and other dams; irrigation by pumping, with notes on the selection of plants.

Enquiries and invitations should in the first instance be addressed to the Director of Agriculture, Salisbury.

### Forestry: Sale of Trees.

The under-mentioned varieties of trees will be available for sale from December onwards. The price is 8s. 4d. per 100 in tins of 25, f.o.r. Salisbury. A quantity of larger sized trees, four in a tin, will also be available at 1s. per tin. In some cases the supplies are limited.

Aloe bulbels and seed of *Dalbergia sissoo* can also be supplied.

Applications, together with cheque or money order, should be addressed to the Government Agriculturist and Botanist, Department of Agriculture, Salisbury.

|                              |                      |
|------------------------------|----------------------|
| <i>Albizzia lebbek</i>       |                      |
| <i>Casuarina leptoclada</i>  | = Beefwood           |
| <i>Cedrela toona</i>         | = Indian toona       |
| <i>Callitris calcarata</i>   | = Cypress pine       |
| „ <i>robusta</i>             | = Murray pine        |
| <i>Cupressus arizonica</i>   | = Arizona cypress    |
| „ <i>lusitanica</i>          | = Portuguese cypress |
| „ <i>sempervirens</i>        | = Common cypress     |
| „ <i>torulosa</i>            | = Himalayan cypress  |
| <i>Dalbergia sissoo</i>      |                      |
| <i>Eucalyptus amygdalina</i> | = Peppermint gum     |
| „ <i>calophylla</i>          |                      |
| „ <i>citriodora</i>          | = Lemon-scented gum  |
| „ <i>longifolia</i>          |                      |
| „ <i>paniculata</i>          | = Iron bark gum      |
| „ <i>robusta</i>             | = Swamp mahogany     |
| „ <i>rostrata</i>            | = Rostrata gum       |
| „ <i>saligna</i>             | = Saligna gum        |
| „ <i>tereticornis</i>        | = Red gum            |
| <i>Pinus densiflora</i>      |                      |
| „ <i>halepensis</i>          | = Aleppo pine        |
| <i>Thuja orientalis</i>      | = Arbor vitæ         |
| „ <i>gigantea</i>            |                      |

### Co-operative Experiments—Winter Cereal Crops

The free distribution of seed of winter cereal crops for trial under irrigation or on naturally moist land will commence about the end of February. The seed is issued free of charge on rail, Salisbury, and farmers taking part in the experiments are required to furnish, at the close of the growing season, on forms supplied for this purpose, an accurate and

complete report on the result of the experiments. In the event of any applicant who has received seed failing to comply with these conditions his name will be removed from the list of those eligible to receive co-operative seeds in the future.

It is anticipated that the under-mentioned varieties will be available for distribution, but since supplies of seed will be limited, early application is advisable, and no guarantee can be given that any particular variety asked for will be forthcoming. As far as possible, applications will be dealt with in the order in which they are received. Not more than three varieties of seed in all can be supplied to each applicant.

Wheat, Early Gluyas

|      |                        |
|------|------------------------|
|      | { Algerian             |
|      | { Garton's New Zealand |
| Oats | { Texas                |
|      | { Smyrna               |
|      | { Sidonian             |

|        |              |
|--------|--------------|
| Barley | { Early Cape |
|        | { Nepal      |

Early Rye

All applications to be addressed to the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, and full particulars to be given regarding the address to which it is desired seed should be consigned.

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#### CITRUS CULTIVATION.

THE services of Mr. C. E. Farmer, Adviser on Citrus Cultivation to the British South Africa Company, are available. The British South Africa Company will be pleased to receive applications from farmers desirous of obtaining advice from Mr. C. E. Farmer on citrus cultivation, and to place his services at the disposal of the farming community, in so far as his duties permit. Applications, which will be dealt with in order of date, should be addressed to the Director of Land Settlement, Salisbury. No fee will be charged for Mr. Farmer's services.



## Departmental Bulletins

The following Bulletins, consisting of reprints of articles which have appeared in this Journal, are available for distribution free of charge to applicants in Rhodesia :—

### AGRICULTURE.

- No. 2. The Possibilities of Rhodesia as a Citrus Growing Country, by R. McIlwaine, M.A., LL.B.
- No. 61. Requirements in sending Botanical Specimens to the Department for Identification.
- No. 62. Services of Agricultural Engineer.
- No. 79. Winter Cereals, by H. Godfrey Mundy, F.L.S.
- No. 81. Possibilities of Export Trade in Oil Seeds, by H. Godfrey Mundy, F.L.S.
- No. 90. Reports on Experiments—Experimental Station, Salisbury, 1910-1911, by J. H. Hampton.
- No. 97. Hints on Irrigation (Pipes and Pipe-laying), by W. Martin Watt, Agricultural Engineer.
- No. 125. Subterranean Water, by W. M. Watt.
- No. 137. Drainage for Irrigated and Swampy Land, by W. M. Watt.
- No. 143. Hints on Planting an Orange or Lemon Grove, by Chas. E. Farmer, Citrus Adviser to the British South Africa Company.
- No. 144. Rhodesian Tobacco—Prospects of an Australian Market, by Eric A. Nobbs, Ph.D., B.Sc.
- No. 153. Citrus Fruit Trees—From Seed to Grove.
- No. 155. The Manuring of Maize on the Government Experimental Farm, Gwebi, 1912-13.
- No. 156. Elephant Grass or Napier's Fodder, by J. A. T. Walters, B.A.
- No. 160. Hints on Irrigation—Pumping Plants, by W. M. Watt, Agricultural Engineer.
- No. 164. Citrus Fruits in Rhodesia—Suggestions as to where to Plant, by C. E. Farmer.
- No. 166. Rhodesian Citrus Fruits—Exportation to London.
- No. —. Orange and Lemon Growing in Southern Rhodesia, by R. McIlwaine.
- Tree Culture in Southern Rhodesia, by P. B. S. Wrey, A.M.I.C.E.

### CROPS.

- No. 88. Chicory Growing, by H. Godfrey Mundy, F.L.S.
- No. 93. Soy Beans, by R. H. B. Dickson.
- No. 106. Cultivation and Preparation of Ginger.
- No. 107. The Cowpea, by R. H. B. Dickson.
- No. 126. Turkish Tobacco.
- No. 123. Paspalum, by J. A. T. Walters, B.A., Assistant Agriculturist and Botanist.

- No. 132. Sumatra Tobacco, Hints to Rhodesian Growers, by C. J. Sketchley.
- No. 133. Tobacco Culture (Virginia)—Planting, Cultivation, Fertilising, Priming, Topping, Suckering, Ripening.
- No. 138. Tobacco Culture (Virginia)—Harvesting and Curing.
- No. 162. Rhodesian Maize: The Principal Types and their Points, by J. A. T. Walters, B.A., Assistant Agriculturist.

## ENTOMOLOGY AND VEGETABLE PATHOLOGY.

- No. 46. The Head Smut of Maize, by H. Godfrey Mundy, F.L.S.
- No. 58. Onion Thrips, by R. W. Jack, F.E.S.
- No. 66. Selection of Spraying Outfit, by R. W. Jack, F.E.S.
- No. 69. Resin Wash and Means of Applying It, by R. W. Jack, F.E.S.
- No. 75. Fumigation of Fruit Trees with Hydrocyanic Acid Gas, by R. W. Jack, F.E.S.
- No. 89. Insect Friends of the Farmer, by R. W. Jack, F.E.S.
- No. 100. Tsetse—Preliminary Notes on the Habits of—by R. W. Jack, F.E.S.
- No. 120. Some Insect Pests of Maize, by R. W. Jack, F.E.S.
- No. 140. Insect Pests of Tobacco in Southern Rhodesia, by R. W. Jack, F.E.S.
- No. 142. The Bean Stem Maggot, by R. W. Jack, F.E.S.
- No. 147. Root Gallworm, by R. W. Jack, F.E.S.
- No. 148. Darkling Beetle Grubs Injurious to Tobacco, by R. W. Jack, F.E.S.
- No. 151. Potato Spraying Experiments for the Control of Early Blight, by Rupert W. Jack, F.E.S.
- No. 154. Borers in Native Timber—Results of Experiments with Preservatives, by Rupert W. Jack, F.E.S.
- No. 158. Two Ladybirds Injurious to Potato Plants, by R. W. Jack, F.E.S.

## VETERINARY.

- No. 50. Epizootic Abortion in Cattle, by Ll. E. W. Bevan, M.R.C.V.S.
- No. 51. Strangles, by F. D. Ferguson, M.R.C.V.S.
- No. 53. Animals Diseases Consolidation Ordinance, 1904.
- No. 77. Animals Diseases Amending Ordinance, 1911.
- No. 80. Detection and Prevention of Diseases of Stock, by Ll. E. W. Bevan, M.R.C.V.S.
- No. 84. African Coast Fever—Diagnosis of Gland Puncture, by Ll. E. W. Bevan, M.R.C.V.S.
- No. 91. Common Ailments of the Horse, by D. R. Chatterley, M.R.C.V.S.
- No. 95. Oestrus-ovis in Sheep, by Alec King.
- No. 103. Dipping and Tick-Destroying Agents, by Lt.-Col. H. Watkins-Pitchford.
- No. 117. Ephemeral Fever or Three Days' Sickness in Cattle, by Ll. E. W. Bevan, M.R.C.V.S.
- No. 121. Rabies, by Ll. E. W. Bevan, M.R.C.V.S., and T. G. Millington, M.R.C.V.S., D.V.H.

Conditions under which Government Veterinary Surgeons' Services are available to the public.

## LIVE STOCK.

- No. 10. Watering and Feeding of Live Stock on Railway.
- No. 96. Swine Breeds and Breeding of, by Loudon M. Douglas, F.R.S.E.
- No. 98. Pig Breeding and Feeding, by T. M. Rixon.
- No. 105. Bacon Curing on the Farm, by Loudon M. Douglas, F.R.S.E.
- No. 110. Utility Poultry Keeping, for Amateurs and Beginners, by "Gallinule."
- No. 123. Feeding and Care of Imported Bulls, by R. C. Simmons.
- No. 145. Prospects for Importation of Cattle from Australia, by Eric A. Nobbs, Ph.D., B.Sc.
- No. 146. Notes on Cattle Breeding, Part II., by R. C. Simmons.
- No. 161. Notes on Cattle Breeding, Part III., by R. C. Simmons.
- No. 163. Feeding and Care of Imported Cattle, by R. C. Simmons.
- No. 167. The Construction of Dipping Tanks for Cattle.

## MISCELLANEOUS.

- No. 93. Formation of Agricultural Credit Associations in Rhodesia, by Loudon M. Douglas, F.R.S.E.
- No. 108. Lime Deposits in Rhodesia and their Value, by G. N. Blackshaw, B.Sc., F.C.S.
- No. 119. Some Notes on Charcoal Burning, by Eric A. Nobbs, Ph.D., B.Sc.
- No. 127. Notes on the Building of Farm Homesteads, by R. C. Simmons.
- No. 129. How to Make Use of the "Fencing Ordinance, 1904," by N. H. Chataway.
- No. 134. Plans and Specifications for Flue Curing Tobacco Barns.
- No. 141. Dry Season and Droughts in Rhodesia, by Rev. E. Goetz, S.J.
- No. 149. Dry Season and Droughts in Rhodesia (continued), by Rev. E. Goetz, S.J.
- No. 150. Dry Season and Droughts in Rhodesia, by the Rev. E. Goetz, S.J.
- No. 152. A School of Agriculture for Southern Rhodesia, by Eric A. Nobbs, Ph.D., B.Sc., Director of Agriculture.
- No. 157. Hints on Brickmaking, by G. T. Dyke.
- No. 159. Gwelo Creamery: Hints and Suggestions to Farmers, by W. G. Elliott.

Health and Clothing.

Malaria: its History, Prevention and Cure, by A. M. Fleming, C.M.G., M.B., F.R.C.S. (Ed.), D.P.H. (Camb.), Medical Director.

Game Law: Summary of.

Terms for Analysis by the Department of Agriculture, of Produce, Soils, Water, etc.

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**HANDBOOK OF TOBACCO CULTURE** for  
Planters in Southern Rhodesia. Sold by the Department of Agriculture. 2/6.



## Employment on Farms.

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The Department of Agriculture receives numerous enquiries from persons of varied attainments, age and financial position for openings on farms, as managers, assistants and learners, requiring remuneration on corresponding scales, or willing to give services in return for keep.

In order that work may be found for the above and needs of farmers met, applications are invited from both employers and persons seeking employment. Applications are also invited from artisans, such as masons, bricklayers, carpenters, fencers, well sinkers, concrete workers, and the like who may desire work on farms. In cases where employers have obtained the labour they require, or applicants for employment have found work, it is requested that notification be at once sent to the Department of Agriculture, in order that unnecessary correspondence be avoided.

Replies to the following applications should be addressed to the initials of the advertisers, c/o Director of Agriculture, who will forward the letter to the party referred to.

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### SITUATIONS VACANT.

A. N.—Requires working partner to invest about £600 in farm near Salisbury. General farming, tobacco and cattle.

J. G.—Requires partner to invest capital and take active interest in farm near Salisbury. General farming, cattle and dairying.

J. S. P.—Learner wanted for tobacco culture and curing. Board and lodging for services.

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### SITUATIONS WANTED.

A. K. H.—As farm manager or assistant; three years' Rhodesian experience; cattle, dairy, general farming, and tobacco (air and flue curing). Thorough knowledge of machinery, tractors, etc., and repairs. Moderate salary and share.

C. A. F.—Employment wanted by man, aged 40, with knowledge of tobacco, cotton and citrus growing, also general farming; references; salary required with percentage of crop.

G. W. D.—As manager or assistant on dairy farm; five years' experience; holding diplomas in dairying. Could invest some capital in suitable farm.

J. F. T.—Farm assistant; general farming and tobacco; moderate salary.

J. W. H.—Farm manager or assistant; general farming and tobacco; salary and share.

P. T.—As farm manager. Twenty years' Natal and Rhodesian experience; cattle, mixed agriculture and tobacco.

F. J. G.—As manager or assistant. Thorough knowledge of stock and general farming.

J. H. G.—As farm manager. Eleven years' Rhodesian experience, including general farming and cattle.

W. D. W.—Twenty-four; wishes experience on mixed farm (cattle a feature). Royal Agricultural College, Cirencester, Gloucestershire, 1907-1910. Some experience of sugar-cane and cattle in Mexico, 1910-1913. Willing to work for small wage with board and lodging.

A. F.—Hungarian, single, aged 29; carpenter by trade, can also build with stone and brick. Speaks English, German, Dutch and Sindebele fluently, also understands general farming. Requires situation on a large estate, such as care, erection and keeping in repair buildings, etc., or management of mixed farm stock. Will go anywhere Northern or Southern Rhodesia.

E. T. S.—Management of farm, on terms to be arranged. Thorough knowledge of stock and general agriculture.

## Government Notices.

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No. 50 of 1912.]

[8th February, 1912.

### AFRICAN COAST FEVER.

*Regulations regarding the movement of cattle and the prevention and suppression of disease.*

1. UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw Government Notices Nos. 329 of 1910 and 308 of 1911 and make the following provisions in lieu thereof :—

2. The various districts of Southern Rhodesia are hereby declared an area infected with African Coast Fever for the purposes of section 5 (2) of the aforesaid Ordinance, and, save as hereinafter set out, all movement of cattle within the said districts is prohibited until further notice.

#### *General Movement.*

3. For the purpose of section 22 (1) of the said Ordinance, the following shall be regarded as places within the boundaries of which the movement of cattle may be allowed without special permission :—

- (a) Single farm.
- (b) Two or more adjoining farms, farmed together under one management and situated within one cattle transport area.
- (c) An area, the property of one owner, enclosed by a substantial fence.
- (d) For grazing purposes, an area within a radius of four miles of native kraals situated on unalienated land or in reserves, save and in so far as such area includes any private land.

The sites of such kraals shall be deemed to be the places where they are situated at the date of promulgation of these regulations.

4. Notwithstanding the provisions of the last preceding section, or of section 9 hereof, the Chief Inspector may, on the outbreak of disease, or for such other cause as may be deemed expedient, direct the isolation or quarantine of cattle on a limited area of the aforesaid places.

5. The movement of cattle from place to place may be permitted under the special permission, in writing, of an Inspector, Sub-Inspector, or other officer or person duly authorised by the Administrator to grant such permission.

6. No permission as aforesaid shall permit the movement of cattle—

- (a) Without the written consent of the owners, occupiers or managers of occupied land, and in the case of native reserves, of the Native Commissioner of the district over which land or reserve such cattle will pass, whether along roads or otherwise; provided, however, that refusal to grant such consent shall be in writing, and provided further that if the Controller of Stock or the Chief Inspector shall consider that such consent is withheld without good and sufficient cause he may permit of movement without such consent.



If any such person mentioned above refuse to give consent or to state a reason for refusing to do so in writing, no valid objection shall be deemed to exist and movement may be permitted without such written consent.

- (b) Within a veterinary district as defined in the Schedule annexed hereto from one transport area to or through another without the consent of the Cattle Inspector in charge of such area.
- (c) From any veterinary district to or through another without the consent of the District Veterinary Surgeon of such district.

#### *Slaughter Cattle.*

7. Cattle moved to any centre for slaughter under the provisions of these or any other regulations shall, on arrival, be immediately taken to such quarantine area (if any) as is provided for the purpose and immediately branded with the letters "V.D." on the near hip.

8. Cattle admitted to a quarantine area in terms of the last preceding section shall be slaughtered within twenty-one days of the date of admission, and shall not be permitted to leave the same except for the purpose of being slaughtered at the appointed abattoir, and if found outside such area, except for the said purpose, may be destroyed on the order of the Chief Inspector or Controller of Stock; provided, however, that the Chief Inspector may allow the removal of cattle from such an area under such conditions as he may prescribe.

#### *Transport Cattle.*

9. The use of cattle for draught purposes is prohibited except:—

- (1) Within the boundaries of the places defined in section 3 (a), (b) and (c) hereof.
- (2) Within the boundaries of areas already fixed for the use of cattle for draught purposes in terms of regulations published under Government Notice No. 329 of 1910, or such other areas as may be fixed by the Administrator.

10. Notwithstanding the provisions of section 9, no permit shall authorise the working of cattle

- (a) which are not clearly and distinctly branded with the registered brand of the owner;
- (b) in any wagon or vehicle which shall not have the owner's name and address legibly and permanently inscribed on the right side thereof.

11. No wagon or other vehicle drawn by oxen shall be moved from one cattle transport area into another without the permission of the Cattle Inspectors concerned, and under such conditions as they may impose.

#### *General Provisions.*

12. On the outbreak or suspected outbreak of disease, the Administrator may declare an area of infection around and embracing the place of outbreak or suspected outbreak, and a further area or areas around such area of infection as a guard area, whereupon all movement of cattle into and from place to place within such area or areas shall be immediately suspended, except as hereinafter provided.

A.—*In areas of infection and guard areas:—*

- (1) Cattle in transit by rail may be moved through such area.
- (2) Cattle from beyond the borders of Southern Rhodesia may be detained within such area or areas *en route* to destination.
- (3) Cattle for *bona fide* farming, dairy and slaughter purposes may be moved into such area or areas by permission of the Chief Inspector and under such conditions as he may impose.

*B.—In guard areas only:—*

Cattle may be moved into and from place to place within such area under the conditions of section 6 hereof.

13. The removal of green forage, hay, fodder, bedding reeds, manure or of such other articles as may be reasonably supposed capable of conveying infection, shall be prohibited from areas of infection, save and except with the special permission of the Administrator.

14. Whenever an area shall have been declared under section 12 hereof, every person within such area, or within such further area as may be specified by Government Notice, owning or in charge of cattle shall, upon the death or slaughter because of disease, suspected disease, or accident, of any such cattle, immediately report such occurrence through the nearest Cattle Inspector, Native Commissioner or Police Officer to the District Veterinary Surgeon.

15. Notwithstanding the provisions of these regulations, it shall be competent for the Chief Inspector of Cattle to authorise and direct the movement of cattle for the purposes of isolating, dipping, quarantine, or any other such objects as may be deemed necessary to prevent or suppress an outbreak of disease.

16. Whenever an area shall have been declared an area of infection or guard area in terms of section 12 hereof, any person who shall allow any cattle to stray or be otherwise removed, except as provided for in these regulations, from any one place within such area to another place, or from a place outside of to a place within such area, shall be guilty of an offence against these regulations.

17. All cattle within the limits of the various commonages and townlands, areas of infection and guard areas as declared under section 12 hereof, or depastured on common grazing ground, shall be dipped or sprayed at least once in every three days, unless the Chief Inspector shall authorise the extension of the time between such dipping or spraying, or the entire suspension of the same.

18. In all areas of infection and guard areas sheep and goats shall be dipped at such periods as may be directed by the Chief Inspector.

19. Whenever the owner, occupier, or manager of a farm shall adopt means of cleansing cattle running thereon, either by spraying, dipping, or by any other method, the Chief Inspector may order any natives or other persons having cattle on the same farm to cleanse such cattle, and the Native Commissioner of the district within which the farm is situated may enter into an arrangement with the native owners of cattle to cleanse such cattle at a charge to be mutually agreed upon between the said owner, occupier or manager and the said native owners.

20. All permits for the removal of cattle issued under the provisions of the said Ordinance or of any regulations framed thereunder shall specify legibly and clearly on the face thereof the place from and to which such cattle may be removed, the route by which they shall travel, the number and brands of such cattle, the time allowed for the journey, and such other particulars and conditions as it may be deemed expedient to provide.

21. No permit issued for the movement of cattle shall be taken to authorise any trespass in connection with such movement.

22. Notwithstanding the provisions of these regulations, it shall not be lawful for any owner of cattle to allow any such cattle to be on any road, public outspan, commonage, or any property other than that of the owner, unless they are free from ticks or unless they have been effectively cleansed by dipping, spraying or other process, within fourteen days of being allowed on such road or other place. Any beast having ten or more ticks on it shall not be considered free from ticks.



23. Any person contravening the provisions of these regulations or the conditions set out in permits issued thereunder, shall, where no higher penalty has been by the said Ordinance or any other law provided, be liable in respect of each offence to a fine not exceeding £20, or in default of payment to imprisonment with or without hard labour for a period not exceeding three months.

### SCHEDULE "A."

#### VETERINARY DISTRICTS OF SOUTHERN RHODESIA.

##### (1) *Salisbury.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912 :—

32. Battlefields; 33. Hartley and Gatooma; 34. Gadzema Station; 35. Makwiro Station; 36. Norton Siding; 37. Hunyani Tank; 38. 1645½ Peg B. & M. & R. Railways; 39. Salisbury A.; 40. Salisbury B.; 41. Salisbury C.; 42. Salisbury D.; 43. Arcturus; 44. Bromley; 45. Marandellas North; 46. Marandellas South; 48. Headlands Station; 49. Junction Mazoe and Lomagundi Railways; 50. 23-Mile Peg, Lomagundi Railway; 51. Passaford Station; 52. 35-Mile Peg, Lomagundi Railway; 53. Gwibi Tank Halt; 54. Banket, Lomagundi; 55. Eldorado, Lomagundi; 56. Selby Siding; 57. Mazoe; and 58. Kimberley Reefs.

##### (2) *Bulawayo.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912 :—

1. Plumtree; 2. Marula Siding; 3. Figtree; 4. Westacre Junction; 5. Bulawayo Area; 6. Heaney Junction; 7. Bembsi Station; 8. Insiza North; 9. Insiza South; 10. Shangani North; 11. Shangani South; 14. Redbank; 15. Nyamandhlovu Station; 16. Malindi Station; 17. Wankies Area; 18. Matetsi Siding; 19. Matopo Terminus; 20. Sabiwa Siding; 21. Gwanda Station; 22. West Nicholson; 23. Belingwe; 59. Essexvale and Balla Balla Areas; 60. Stanmore Siding Area; 61. Filabusi Area.

##### (3) *Gwelo.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912 :—

12. Somabula Siding; 13. Gwelo Station; 24. Selukwe Area; 25. Surprise Area; 26. Indiva Siding; 27. Lalapanzi; 28. Iron Mine Hill Siding; 29. Umvuma Siding; 31. Que Que Station.

##### (4) *Umtali.*

An area comprising the native districts of Umtali, Melssetter, Makoni and Inyanga.

No. 24 of 1914.]

[14th January, 1914.

### AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Government Notices Nos. 82, 129, 143, 258, 297 and 326 of 1913, and, in terms of section 12 of Government Notice No. 50 of 1912, declare the following areas of infection and guard areas :—



## (1) NATIVE DISTRICT OF MATOBO.

(a) *Area of Infection.*

The farms Collaton and Irene and the Mabogutwani Outspan.

## (2) NATIVE DISTRICT OF SALISBURY.

(a) *Areas of Infection.*

- (1) The farm Haydon.
- (2) Hatfield Estate and Hatfield Estate Plots.
- (3) Salisbury Commonage.

(b) *Guard Areas.*

(1) The farms Stamford, Homefield, Kinvarra, Mount Hampden, Mount Hampden Reserve and Good Hope.

(2) The farms Warren, Lochinvar, Willowvale, Makabusi Outspan, Ardbennie Township, Waterfall, Hopley, Saturday Retreat, Odar Outspan, Stoneridge, Spreckley, Eyrecourt, Eyerston, Retreat, Prospect, Bunkers Hill, Adair, Boutelle, Godavery, Twentydales, Deanesbrook, Glenwood, Adelaide, Epworth, Ventersburg, Lorelei, Makabusi, Gallagher's, M.T.C. and the Letombo Reserve.

## (3) NATIVE DISTRICT OF UMTALI.

(a) *Areas of Infection.*

(1) The farms Inodzi, Nyagari, Mountain Home (The B.), Umtali Mission and the Penhalonga Valley.

(2) The farm Mabonda.

(b) *Guard Area.*

That portion of the native district of Umtali bounded on the south by a line running from the Odzi River along the south-western boundaries of the farms Odzi Junction, Grange, and Premier Estate, the western and southern boundaries of Wiermouth and the southern boundaries of Devonshire and Umtali Commonage.

No. 353 of 1913.]

[4th December, 1913.

## COMPULSORY DIPPING.

UNDER and by virtue of the powers vested in me by section 7 of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare that all cattle within the area defined in the subjoined schedule shall be dipped in an effective arsenical dip from such date and at such intervals as the Chief Inspector may direct.

## SCHEDULE.

An area including parts of the native districts of Bulawayo, Umzingwane, Matopo, Bubi and Bulalima-Mangwe, bounded by and including the following farms:—Lochard Block, Greenlands, Wessels, Allendale A, Oscardale, St. Ninians, Finchams, Robert Block, Lortondale, Wynslay Estate, Braemar Block, Portive, Induna, Waterfall, Dingaan, Rouxdale, Fundisi, Umkien, Seaborough, Dovenby, Helenvale (excluding farms 1, 3 and 16), Slight's, Billars, Craiglee, Blewbonny, Milievale, Dewsbury, Joe's Luck, Honeybird Kop, Doublevale, Maritzburg, Springvale, Outspan No. 3, Tati Road, D'Hoop, Anglesea, Mineral King, World's View, Matopo Block, Brethren in Christ Mission Farm, Absent, the unsurveyed land lying north of a line drawn from the south-east beacon of Absent to the south-west beacon of The Range, The Range, Clark's, Swaithe's, Limerick, Pioneer's Rest, Hayhill, Rietfontein, Bradford, Hamilton, Mayfair, York, Indina, Rathline, Westondale, sub-division A of Fochabers, Fochabers, Kodhwayo, Zimbile and Lochard Outspan.

No. 369 of 1913.]

[11th December, 1913.

## IMPORTATION AND USE OF VIRUS, VACCINE, ETC.

UNDER and by virtue of the powers vested in me by section 5, sub-section (6) (e), of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby provide as follows:—

(1) No person, firm or corporation shall manufacture, import, sell, barter or exchange any virus, vaccine, serum or analogous product used for the diagnosis or treatment of diseases of animals without the permission in writing of the Chief Inspector.

(2) No person shall use any virus, vaccine, serum, blood, bile or analogous product for the diagnosis or treatment of animals without the permission in writing of the Chief Inspector.

(3) Any person desiring to import, manufacture, sell, barter or exchange or to use any of the above-mentioned substances or products shall apply to the Chief Inspector for his requisite permission, which may be refused or granted under such conditions as the Chief Inspector may impose.

(4) Any person contravening any of the above regulations or failing to observe the conditions attached to any permit issued in terms of the last preceding sub-section shall be liable on conviction to a fine not exceeding £20, or in default of payment of any fine inflicted to imprisonment with or without hard labour for a period not exceeding three months.

No. 110 of 1908.]

[16th April, 1908.

## IMPORTATION OF CATTLE.

UNDER and by virtue of the powers conferred on me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and repeal so much of the Regulations published under Government Notice No. 187, dated the 26th of July, 1906, as relate to the importation of cattle from the Colony of the Cape of Good Hope and the United Kingdom of Great Britain and Ireland, and make the following provisions in lieu thereof:—

1. The importation of cattle may be permitted from the Colony of the Cape of Good Hope and the Orange River Colony on the following terms and conditions—

- (1) A permit shall be required from the Chief Inspector which may contain such conditions as shall from time to time appear expedient.
- (2) Applications for permission to import shall be in the Form "A" attached hereto, and accompanied by a declaration in the annexed Form "B"
- (3) The importation of cattle with more than two permanent central incisor teeth shall not be permitted.
- (4) All importations shall be by rail and for the purposes thereof Bulawayo shall be regarded as the port of entry.
- (5) All cattle imported in terms of these Regulations shall on arrival at Bulawayo, Salisbury, or Umtali be removed to a place of quarantine under the supervision of an Inspector of Cattle, there to be submitted to such examination and tests as the Chief Inspector may direct. If such examination or tests disclose the existence of any destructive disease the cattle shall be immediately destroyed and the carcasses thereof disposed of in such manner as a Government Veterinary Surgeon may authorise or require. The Chief Inspector may permit of any examination or tests as aforesaid being dispensed with in the case of cattle in transit by rail for any place beyond the boundaries of Southern Rhodesia.



- (6) All expenses or losses incident to quarantine, examination, testing or destruction as aforesaid shall be borne by the owner of the cattle.
2. The importation of cattle from the United Kingdom of Great Britain and Ireland may be permitted under the following terms and conditions—
- (1) Importation shall be through and direct from the coast ports of the Cape Colony, and there shall be a consignment note or other satisfactory evidence that cattle so imported have come direct from Great Britain or Ireland.
- (2) The provisions of sub-sections (5) and (6) of section 1 hereof shall apply to importations in terms of this section.
3. No person shall import cattle in terms of these Regulations except for his own use, provided however that permission may be granted to import for others on the applicant disclosing the name of the person or persons for whom he proposes to act.
4. Any person introducing cattle in contravention of these Regulations, or failing to comply with any conditions attached to permits to import, or furnishing applications, declarations, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, testing, destruction or disposal of carcasses, shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties shall have been provided for such offences by the "Animals Diseases Consolidation Ordinance, 1904," provided however that the penalties imposed by these Regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

## ANNEXURE "A."

## APPLICATION FOR CATTLE IMPORTATION PERMIT.

1. Applicant's Name and Address.....
  2. Number and Class of Cattle to be imported.....
  3. Area or Farm and District where Cattle are at present located.....  
.....
  4. Area or Farm and District to which Cattle are to be moved.....  
.....
- Applicant's Signature.....
- Date.....
- Application.....
- Permit No.....

## ANNEXURE "B."

I, ..... residing on the farm  
..... in the district of ..... do  
solemnly and sincerely declare that the .....  
(number in writing) animals also enumerated below have been in my pos-  
session since birth, and that Lungsickness (Contagious Pleuro-Pneumonia)  
has not existed amongst any of my cattle, nor on my farm, during the last  
four years, and that no other bovine disease scheduled under the Diseases  
of Stock Act, 1911 (Union of South Africa) has existed amongst any of my  
cattle, nor on my farm, during the last twelve months, and that these  
animals have never been exposed for sale in any public market or stock  
fair.



Number of Animals ..... Bulls ..... Heifers .....  
 Breed .....  
 Seller's Name and Address .....  
 Purchaser's Name .....  
 Place in Southern Rhodesia to which animals are being sent  
 .....  
 And I make this solemn declaration conscientiously believing the same  
 to be true.  
 .....  
 Declared to at ..... on this ..... day of .....  
 before me,  
 .....  
 Resident Magistrate for the District of .....

No. 127 of 1910.]

[2nd June, 1910.

### IMPORTATION OF CATTLE FROM NORTH-EASTERN RHODESIA.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that the importation of cattle from North-Eastern Rhodesia may be permitted under the following terms and conditions:—

1. The permission of the Chief Inspector of Cattle be first had and obtained.
2. All cattle shall be introduced by way of the town or port of Feira, which is hereby declared a port of entry.
3. All applications for permission to import shall be accompanied by—
  - (1) A certificate by a Government Veterinary Surgeon of the territory of origin that—
    - a. the districts from which they come and through which they pass are free from contagious diseases of animals;
    - b. the animals in respect of which the application is being made have been examined and are free from any destructive disease.
4. All cattle shall on entry be taken to a quarantine area defined by the Chief Inspector of Cattle, and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, not less than three months.
5. Cattle at Feira at the date of promulgation of this notice may be removed to the quarantine area on permission of the Chief Inspector of Cattle without the certificates detailed above.
6. Any person found introducing cattle in contravention of these regulations, or failing to comply with any of the conditions attached to permits to import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties have been provided for such offence by the "Animals Diseases Consolidation Ordinance, 1904"; provided, however, that the penalties imposed by these regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

## SCHEDULE "A."

## 1. CERTIFICATE UNDER SECTION 3. (1), a.—

I hereby certify that I have examined the following cattle belonging to  
Mr. ....

..... Cows and heifers,  
..... Calves,  
..... Oxen and bulls,

and that the districts from which they come and through which they will pass in this territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signature .....  
Government Veterinary Surgeon.

## 2. CERTIFICATE UNDER SECTION 3. (1), b.—

I hereby certify that I have examined the following cattle belonging to  
Mr. ....

..... Cows and heifers,  
..... Calves,  
..... Oxen and bulls,

In my opinion these animals are free from all destructive diseases.

Signature .....  
Government Veterinary Surgeon.

No. 211 of 1910.]

[4th August, 1910.

### IMPORTATION OF CATTLE FROM NORTH-WESTERN RHODESIA.

UNDER and by virtue of the powers vested in me by the "Animals-Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that, notwithstanding the prohibition contained in Government Notice No. 89 of 1908, the importation of cattle from North-Western Rhodesia may be permitted under the following terms and conditions:—

1. The permission of the Chief Inspector of Cattle shall be first had and obtained.

2. All cattle shall be introduced (a) by rail via the Victoria Falls, or (b) by way of the town or port of Feira, which are hereby declared to be ports of entry.

3. All applications for permission to import shall be accompanied by a certificate by a Government Veterinary Surgeon of North-Western Rhodesia that—

- (a) the districts from which they come and through which they pass are free from contagious diseases of animals;
- (b) the animals in respect of which the application is being made have been examined and are free from contagious diseases of animals.

4. All cattle shall on entry be taken, where possible by rail, to such quarantine area and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, but not less than three months.

5. Any person found introducing cattle in contravention of these regulations, or failing to comply with any of the conditions attached to permits to import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all

lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months; provided, however, that the penalties imposed by these regulations shall not exempt from liability to penalties, forfeiture, or destruction, elsewhere provided for

### ANNEXURE "A."

#### *Certificates under Section 3.*

(a) I hereby certify that I have examined the following cattle belonging to Mr. ....

.....cows and heifers,

.....calves,

.....oxen and bulls,

and that the districts from which they come and through which they will pass in this Territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signed.....

Government Veterinary Surgeon.

(b) I hereby certify that I have examined the following animals belonging to Mr. ....

.....cows and heifers,

.....calves,

.....oxen and bulls.

In my opinion these animals are free from all destructive diseases.

Signed.....

Government Veterinary Surgeon.

NOTE.—All numbers are to be expressed in words.

### IMPORTATION OF STOCK FROM THE PROVINCE OF THE CAPE OF GOOD HOPE.

WITH reference to Departmental Notice of 28th February, 1912, it is hereby notified that the said Notice is cancelled, and importation of stock will now be permitted, in terms of Government Notice No. 110 of 1908, from the Province of the Cape of Good Hope, with the exception of the following districts :—

Komgha  
East London

Peddie  
Victoria East  
Kingwilliamstown  
Stutterheim  
Cathcart

Stockenstroom  
Queenstown (Gwatyu Ward  
only)  
Glen Grey  
Maclear  
Elliot Slang River  
Wodehouse  
Barkly East



No. 375 of 1912.]

[28th November, 1912.

## IMPORTATION OF POULTRY.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," as amended by the "Animals Diseases Amendment Ordinance, 1910," I do hereby declare and make known that the following regulations shall be in force and effect from date of publication hereof :—

(1) All poultry imported by rail shall be inspected by an Inspector or Sub-Inspector at Plumtree, Bulawayo or Umtali.

(2) Should any consignment of poultry shew symptoms of disease, or should such Inspector or Sub-Inspector have reason to believe that any disease exists in, or that infection is likely to be conveyed by such consignment, he may order the detention and isolation of the whole consignment for such period as he may deem necessary.

(3) The Chief Inspector may order the destruction of all poultry which he has reasonable grounds for believing to be diseased or likely to convey infection.

---

THE following extract from Live Stock Regulations, printed on page 150 of the South African Railways Official Tariff Book, is published for general guidance :—

Poultry are not accepted by rail unless they are placed in a crate and the following conditions are complied with :—

(1) The size of the crate shall be 3 feet 6 inches by 2 feet 9 inches external floor dimensions; for turkeys and geese the height shall be 30 inches; and for fowls, ducks, and poultry of a like size, the height shall be 20 inches.

(2) Each crate must contain two drinking vessels filled with pure water, such vessels to be not less than five inches in depth, of the unspillable type, one being fixed at opposite corners of the coop.

(3) Each crate shall contain two receptacles for food of a suitable size, filled with suitable food other than whole maize.

(4) The birds must not be over-crowded in the crates, and in no case must there be more than 20 fowls, ducks or other birds of a like size, or ten turkeys or geese.

(5) Different species of birds must not be placed in the same coop.

Unless coops, crates, and the like are strong enough to bear ordinary transit handling, the Administration will not accept responsibility for loss.

No. 336 of 1911.]

[26th October, 1911.

## RABIES.

THE following instructions regarding the treatment of persons bitten by rabid animals are published for general information.

In every case where a person has been bitten by a dog or other animal known or suspected to be rabid, the following precautions are recommended :—

(1) The wound should be immediately and thoroughly cauterised. This, if it does not altogether prevent the disease, delays its onset sufficiently for Pasteur treatment to be successfully applied.

(2) The patient should be sent to Salisbury for treatment at once. Delays are dangerous.

(3) The fullest information should be sent to the Health Department as to date when bitten, locality, fate of dog, and especially reasons for supposing the dog to be mad.

## SUMMARY OF THE "GAME LAW CONSOLIDATION ORDINANCE, 1906," AND REGULATIONS ISSUED THEREUNDER.

The Ordinance divides the game into three distinct classes, described as follows :—

- (a) Birds and Small Buck.
- (b) Bushbuck, Hartebeest, Impala, Lechwe, Pookoo, Roan and Sable Antelope, Sitatunga, Tsessebe, Waterbuck, and Wildebeest.
- (c) Royal Game, which includes Eland, Elephant, Giraffe, Gemsbok, Hippopotamus, Inyala, Koodoo, Ostrich, Rhinoceros, Springbuck and Zebra.

The shooting season for Class "A" is as follows :—

In Mashonaland :

Birds from 1st May to 30th September.

Small Buck from 1st May to 31st October.

In Matabeleland :

Birds and Small Buck from 1st May to 31st October.

To shoot in Class "A" a licence costing £1 per annum is required. This entitles holders to hunt in both Provinces during the open season.

Class "B."—The season opens on 1st July and closes on 30th November in both Provinces. The licence fee is £25 for non-residents and £5 for persons having their domicile in Southern Rhodesia. This licence entitles the holder to shoot up to 15 head, which number may be increased to a total of 25 upon payment of a further sum of £15 in the one case and £5 in the other.

Class "C."—The Administrator may, if he is satisfied that the animals are actually required for scientific purposes, grant to the holder of a game licence permission to shoot or capture any of the species included in this Class. Such permit requires a £5 stamp. Applications in writing, together with proof of *bona-fides*, should be addressed to the Director of Agriculture.

Game for Farming Purposes.—Permits may be granted for the capture of Eland, Ostrich, Zebra or other animals for the purposes of breeding or farming. Such permits require a stamp of the value of £1 and remain in force for six months. Application, accompanied by a sworn declaration, should be made through the Director of Agriculture or the Civil Commissioner of the district.

Game Injuring Crops.—The occupier of any cultivated land or any person acting under the authority of such occupier, may at any time destroy game actually doing damage on such land.

Elephants on Occupied Farms, Melsetter.—The destruction of Elephants when found on occupied farms on the High Veld in Melsetter District is authorised (*vide* Government Notice No. 284 of 1908).

Tsetse Fly Areas.—Government Notices Nos. 201, 207 and 321 of 1913 suspend the close season for all classes of game, with the exception of ostriches and other birds classified as game, within the following areas in the Hartley district and the Sebungwe district for a period of one year from 1st July, 1913, and Lomagundi district for one year from 1st November, 1913 :—

Hartley District.—From the railway bridge on the Umfuli River, thence north-westwards along the Umfuli River to where it joins the Umniati River, thence southwards along the Umniati River to where it joins the Umsweswe River, thence eastwards along the Umsweswe River up to the drift at the Lydia Mine, thence along the old road from Lydia Mine to Etua Mine and to Inez Mine, thence northwards along the road from Inez Mine to Hartley, thence in the direction of the railway bridge to the starting point on the Umfuli River.



**Sebungwe District.**—From the confluence of the Sengwe and Lutope Rivers up the Lutope to its headwaters, thence in a south-east and easterly direction following the southern edge of the escarpment, leaving Meare's farm to the south, to the Mafungabusi Peak, thence northwards along the escarpment to the Njelele River, and down that river to its confluence with the Sanyati River, thence northwards down the Sanyati River to its confluence with the Piriwiri River, thence direct in a north-westerly direction to Picaninyemba, and thence along the footpath to Nenyunka on the Sengwe River, thence southerly up the Sengwe River to its confluence with the Lutope.

**Lomagundi District.**—An area bounded by a line drawn from the junction of the Angwa and Mkwichi Rivers, in a southerly direction up the Angwa to its junction with the Chumsenga River; thence easterly direct to the junction of the Hunyani and Msitkwe Rivers; thence northerly down the Hunyani to a point opposite Mokore Hill; thence westerly to the junction of the Angwa and Mkwichi Rivers.

Game may be shot in these areas without a licence.

Game in Class "A" may be hunted in the close season until further notice on private land in the Melsetter district by holders of a licence.

**Protected Areas.**—No game may be hunted or killed within the limits of the Commonage or Townlands of Bulawayo and within a radius of two miles of the Court House, Gwelo, or within the Urungwe Game Sanctuary, as defined by Government Notice No. 237 of 1906.

"Locust Birds" are strictly protected, *vide* Government Notice No. 390 of 1912.

**Export of Game.**—No living Game or the Eggs of any Game Birds may be exported beyond the limits of Southern Rhodesia without a written permit.

**Shooting on Private Land.**—A licence does not entitle the holder thereof to shoot on private land without the permission of the land-owner.

No. 390 of 1912.]

[19th December, 1912.

#### PROTECTION OF LOCUST BIRDS.

UNDER and by virtue of the powers vested in me by the "Game Law Consolidation Ordinance, 1906," I do hereby declare that the following Locust Birds :—

- (1) Great Locust Bird or White Stork (*Ciconia alba*);
- (2) Lesser Locust Bird or Nordmann's Pratincole (*Glarecla melunoptera*);
- (3) Small White Heron or Cattle Egret (*Bubulcus ibis*);
- (4) Wattled Starling (*Dilophus carunculatus*);

are added to class "A" of the said Ordinance, and shall be strictly protected, and not hunted or destroyed, throughout Southern Rhodesia for a period of five years from date hereof.

No. 249 of 1908.]

[27th August, 1908.

#### PROTECTION OF TREES.

IT is hereby notified for public information that any person who shall cut down for use as fuel, or for any other purposes than *bona-fide* farming, mining or manufacturing purposes, or cause to be so cut down the "Wild Westeria" (native name M'Pakwa or M'poea) tree, will be liable to prosecution for contravention of the provisions of the Forest and Herbage Preservation Act, 1859, and upon conviction to a fine not exceeding £100, or to



imprisonment with or without hard labour for a term not exceeding six months, or to such fine and imprisonment, or to such imprisonment without a fine.

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No. 211 of 1909.]

[16th September, 1909.]

#### PRODUCE FROM NATAL AND TRANSVAAL.

UNDER and by virtue of the power vested in me by section 8 (2) of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction from Natal and the Transvaal of the undermentioned produce thereof:—Grass, straw, hay, lucerne hay, forage, green lucerne, sugar cane, or any other bedding or fodder plant.

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No. 350 of 1913.]

[4th December, 1913.]

#### ESTABLISHMENT OF POUND AT NYAMANDHLOVU.

UNDER and by virtue of the powers vested in me by section 5 of "The Pounds and Trespasses Ordinance, 1903," I do hereby declare and make known that, at the request of the Civil Commissioner, Bulawayo, a pound has been established on the farm Enyamandhlovu, at Nyamandhlovu, in the magisterial district of Bulawayo, and that the said pound shall be available for the public as from the 10th December, 1913.

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No. 351 of 1913.]

[4th December, 1913.]

#### ESTABLISHMENT OF POUND ON FARM LEIGHTON, BUBI DISTRICT.

UNDER and by virtue of the powers vested in me by section 5 of "The Pounds and Trespasses Ordinance, 1903," I do hereby declare and make known that, at the request of the Civil Commissioner, Bulawayo, a pound has been established in the sub-district of Bubi, on the farm Leighton, in the magisterial district of Bulawayo, and that the said pound shall be available for the public as from the 28th November, 1913.

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No. 352 of 1913.]

[4th December, 1913.]

#### ESTABLISHMENT OF POUND AT RUSAPE.

UNDER and by virtue of the powers vested in me by section 5 of "The Pounds and Trespasses Ordinance, 1903," I do hereby declare and make known that, at the request of the Civil Commissioner, Umtali, a pound has been established at Rusape, in the magisterial district of Umtali, and that the said pound shall be available for the public as from the 21st November, 1913.

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No. 376 of 1913.]

[24th December, 1913.]

#### ESTABLISHMENT OF POUND AT INFININGWE FARM, INSIZA DISTRICT.

UNDER and by virtue of the powers vested in me by section 5 of "The Pounds and Trespasses Ordinance, 1903," I do hereby declare and make known that, at the request of the Civil Commissioner, Bulawayo, a pound has been established on the farm Infiningwe, Insiza, in the magisterial district of Bulawayo, and that the said pound shall be available to the public as from 2nd January, 1914.

## Department of Posts and Telegraphs,

Southern Rhodesia.

Postal Notice No. 12 of 1913.

### AGRICULTURAL PARCELS POST.

IT is hereby notified for public information that, on and after the 1st August, 1909, any article produced, and, if manufactured, produced and manufactured within Southern Rhodesia may be transmitted by Agricultural Parcels Post at the reduced rate of threepence per lb. or fraction thereof, up to a limit of eleven lbs. in weight.

The Agricultural Parcels Post is designed to bring the producer into direct communication with the consumer, and is available for the transmission of :—

|                        |             |              |
|------------------------|-------------|--------------|
| Biscuits               | Dried Meats | Plants       |
| Bread                  | Eggs        | Poultry      |
| Butter                 | Flour       | Seeds        |
| Confectionery          | Flowers     | Sugar        |
| Cigarettes             | Honey       | Tobacco      |
| Dried & Bottled Fruits | Jam         | Wool Samples |

and other articles produced within Southern Rhodesia. It does not extend beyond the borders of Southern Rhodesia.

The senders of articles at the reduced tariff applicable to the Agricultural Parcels Post will be required to sign a declaration that the contents are the *bona fide* produce of Southern Rhodesia.

The limits of size and weight, and the general regulations, are those applicable to the Inland Parcels Post.

G. H. EYRE,  
Postmaster General.

General Post Office, Salisbury,  
31st March, 1913.

### REDUCED RATES FOR MOLASSES FOR STOCK FEEDING.

THE Beira and Mashonaland and Rhodesia Railways announce that, with effect from 1st January, 1914, Molasses in drums for stock feeding will be conveyed in full truck loads (minimum 15 tons), owner's risk, at the scale of rates applicable to Dip, page 102 of Tariff Book No. 6.

This scale will operate from Beira and Mafeking, superseding the half 3rd class rate recently quoted from Beira to Salisbury, and will be applied separately over the Lomagundi and Mazoe Branches.

### REDUCED RATE FOR CATTLE LICKS.

THE Beira and Mashonaland and Rhodesia Railways announce that, with effect from 1st January, 1914, the rate for cattle licks (salt) will be reduced from 3rd to 4th class; minimum 50 lbs.; no lower charge than 1s. per consignment.

### SPECIAL RATES FOR FRUIT EXPORTED OVERSEA.

THE Beira and Mashonaland and Rhodesia Railways announce that, with effect from 1st January, 1914, fruit for export oversea, beyond South Africa, will be conveyed from any station on these Railways (including Broken Hill-Congo Border section) to Beira at a maximum rate of 20s. per ton, and to Union Ports at a maximum rate of 30s. per ton, Station to Station, Owner's Risk.

**British South Africa Company.**

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**GOVERNMENT FARM, GWEBI**

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**AT STUD**

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**FRIESLAND BULL.**

***Dutchland Colantha Sir Cornucopia.***

No. 92,533 A.H.F.H.B.

This bull was recently purchased from Mr. A. J. Maclaurin, by whom he was imported from the United States of America. He comes of a family of very noted milking powers. The record average production over seven days of his dam and grand-dam was 30-40 lbs. of butter.

**Fee £2 2s.**

**SHORTHORN BULL.**

***Favourite Pride.***

A pedigree red shorthorn bull, bred by Mr. James Durno, Rothiebrisdane, Fyvie, Scotland, and imported in 1911, and entered in the Coates Shorthorn and South African Stud Books.

**Fee £2 2s.**

**LARGE BLACK BOAR.**

***Honingberg Bridgman II.***

No. 195, S.A. Stud Book, vol. vi.

Bred by Mr. S. C. Skaife, Bloemfontein.

**Fee 5s.**

**ALL FEES ARE STRICTLY PAYABLE IN ADVANCE.**

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**FOR SALE**

**MERINO RAMS.**

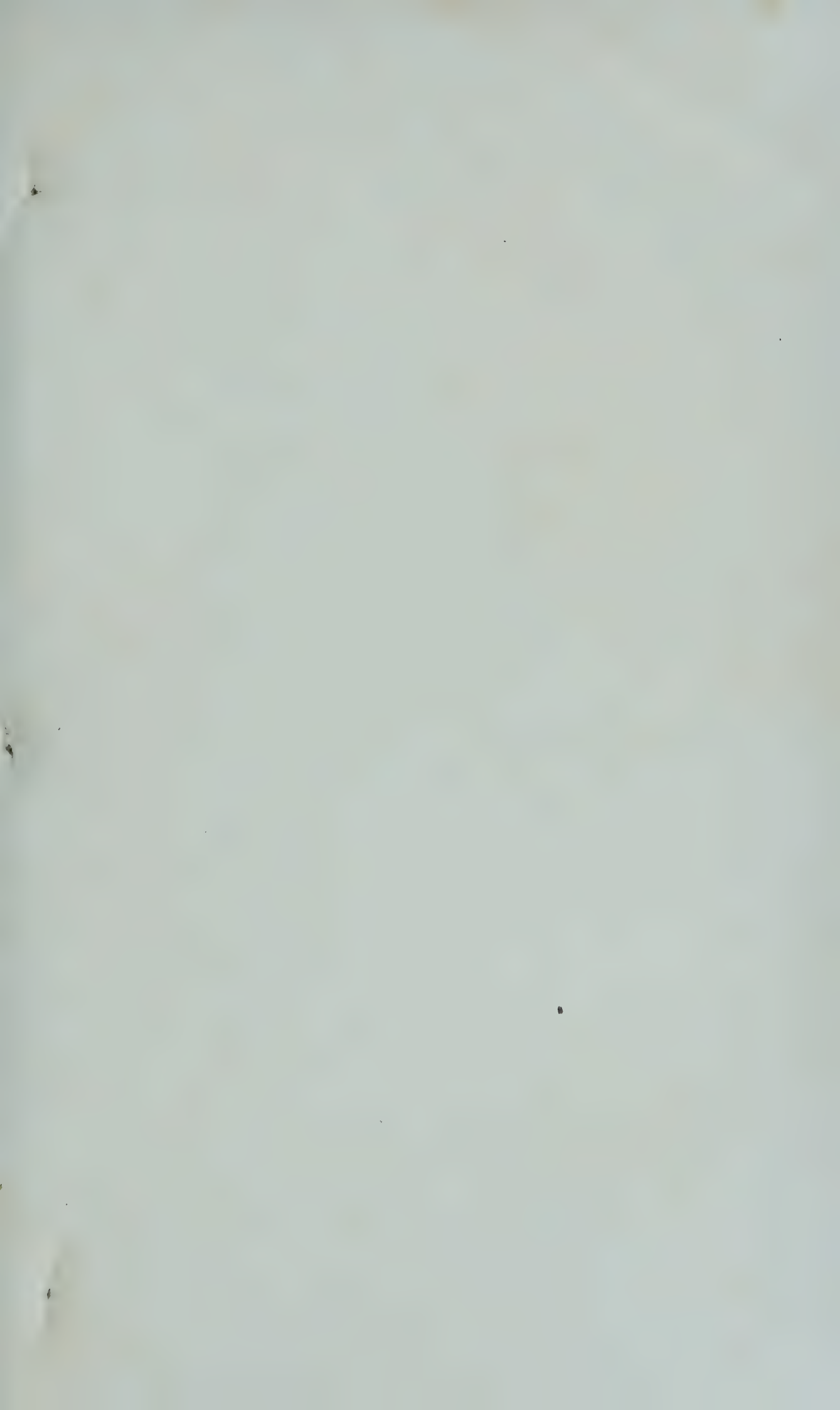
A limited number of pure merino rams are from time to time available at  
**£4 each.**

**PAYMENTS MUST BE MADE WITH ORDER.**

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Full particulars regarding above may be obtained on application to the  
DIRECTOR OF AGRICULTURE, Salisbury.







Falls on upper reaches of the Pungwe River,  
Inyanga District.



# THE RHODESIA Agricultural Journal.

*Edited by the Director of Agriculture,  
assisted by the Staff of the Agricultural Department.*

PUBLISHED BI-MONTHLY.

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## Editorial.

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*Correspondence on subjects affecting the farming industry of Southern Rhodesia is invited. Enquiries will be replied to direct, or through the medium of the JOURNAL. An interchange of ideas and suggestions between farmers will be particularly welcomed. Contributions of a suitable nature for insertion in this JOURNAL will be much appreciated. All communications regarding these matters, and advertisements, should be addressed to the Editor, Department of Agriculture, Salisbury.*

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THE AGRICULTURAL UNION.—The eleventh Congress of the Rhodesia Agricultural Union was held in Bulawayo in the last week of February. The Congress brought together a most representative gathering of farmers, and resulted in a series of discussions, the importance of which to the farming community it is difficult to over-estimate. The high tone in general of the debates was most marked, and discussion of the many important subjects before the Congress was free and comprehensive. After four years' tenure of the presidential chair through strenuous and difficult times, Mr. R. A. Fletcher retired, handing over the affairs of the Union in a healthful



and vigorous state, for which the Congress awarded him warm and sincere acknowledgments. Mr. E. Wilson, who is chairman of the Association at Salisbury, where the next Congress is to take place, was appointed as Mr. Fletcher's successor. Beside the sederunts which occupied three days from morning to late at night, the members of the Congress enjoyed an excursion to the Matopos as the guests of the Rhodes Trustees, and were also banquetted by the Bulawayo Association.

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**PURCHASE OF STOCK FOR FARMERS.**—As intimated to the Farmers' Congress, the Government has, after careful consideration, come to the conclusion that the time has now arrived to discontinue the purchase, on behalf of farmers on favourable terms, of live stock in the south. It is thought that enough has been done in this direction by the Government, and it is proposed to leave the matter now to private enterprise. For some time past the purchases of stock through the Department, although increasing, have been lessening in proportion to the quantities procured through ordinary trade channels, indicating that private dealers are now able to meet requirements in this respect. During 1912 the Department purchased for farmers 59 bulls and 382 heifers, and in 1913, 104 bulls and 403 heifers, the total importations from all sources for the two years being respectively 4,054 and 6,197 head.

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**IMPORTATION OF CATTLE.**—Attention is directed to Government Notice No. 128 of 1914, published at the end of this *Journal*, amending the regulations regarding the importation of cattle into this Territory. Cattle may now be imported from the Transvaal under the same conditions as apply to importations from the Cape Province and Orange Free State. An important modification of the old restrictions is the raising of the age limit in respect of registered pedigree stock, and the introduction of cattle with not more than four broad teeth is now permitted, provided the animals are entered in the South African Stud Book or the appendix thereto. As regards oversea, Germany has been added to the list of countries from which importation under certain conditions is permitted. All

applications to import cattle must be addressed to the Chief Veterinary Surgeon, Salisbury, until further notice. Hitherto the importation of cattle purchased at shows and sales of stud stock in the Union has not been permitted. This restriction has now been removed, and, subject to the provisions of the notice, such importation will be allowed.

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#### SUPPLIES OF RANCHING HEIFERS IN THE UNION PROVINCES.

—We are informed that large supplies of heifers suitable for ranching purposes and complying with the Government regulations cannot be expected from the eastern and midland districts of the Cape Province, but that suitable heifers are obtainable in the districts of Clanwilliam, Calvinia, Frasersburg, Sutherland, Carnarvon, Prieska, Bredasdorp and Caledon in the Cape Province. The approximate prices of such heifers would be about £7 per head f.o.r. Worcester and stations north thereof.

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AGRICULTURAL STATISTICS.—It is seldom that such a strong feeling of unanimity is shewn and the importance of a novel proposal so immediately recognised and so warmly supported as was the motion brought forward at the Farmers' Congress in favour of compelling all farmers to furnish periodical statistics regarding crops and live stock, in order that through a proper statistical bureau adequate data may be compiled and published for general information. In the debate the uselessness of any voluntary or optional system was recognised, and at the same time the strictly confidential nature of the individual returns was emphasised. The accuracy of all statistical aggregates depends on the completeness of the figures and the reliability of the sources of information; while to be of the most value, the particulars collected must be intelligently compiled and promptly published. This matter was referred to in these pages in our last issue, and it was evident from the tone of the debate that its importance and urgency is recognised.

One of the main objects in view is the gauging of supply and demand of our farm products, so as to guide production



and prevent gluts or shortages, while the regulation of the distribution of supplies to various markets, so as to minimise the fluctuation of prices which always interferes with the security of trade, is necessary. The progress of the country can be gauged by the comparison of data collected over an extended period, and it is only by such data that our actual economic condition or financial position and national status can be estimated.

To the farmer and the merchant not only are the results of the harvest and an enumeration of our stock of importance, but so also is reliable information regarding the acreages under growing crops and the prospects of the season.

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**GRADING OF MAIZE.**—The Farmers' Congress took up this matter strongly, recognising the importance of controlling the quality of our staple export, in order to maintain the high reputation we have already gained in the world's markets, and to ensure that only good grain in sound condition should be sent out of the country, either oversea or to the inland markets of the Congo or the Union. The Director of Agriculture stated that the Government is in a position to grade maize locally, and to deal with quantities likely to be forthcoming this or next season, and mentioned that the subject of grading for oversea export was at present receiving its very careful consideration.

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**STOCK THEFTS.**—An interesting discussion took place at the Farmers' Congress regarding thefts of stock, and in connection with this matter one point was raised which perhaps deserves amplification. The scarcity of pounds was referred to, and distance urged as a reason for failure to drive stock to the pounds; Government was, therefore, urged to establish more pounds. It appeared not to be generally realised that this is a matter very much in the hands of the farmers themselves, and that the Government is prepared to allow pounds to be created wherever such appear to be required. This is a matter which we consider the various farmers' associations might with advantage take up.



INSURANCE OF CATTLE.—The proposals regarding the formation of a co-operative stock insurance society were brought forward at the Farmers' Congress by Mr. A. R. Morkel, and received hearty approbation in principle. After consideration, a strong standing committee was formed and empowered to deal further with the subject. We publish here the main points of the scheme as submitted for consideration:—

1. It is proposed that a Co-operative Insurance Society be formed for the purpose of insuring owners of cattle against losses of cattle through outbreaks of epizootic diseases.

2. The name of the Society shall be “The Rhodesia Mutual Cattle Insurance Society.”

3. Owners of cattle shall be invited to become members on the payment of 1s. per head of cattle possessed. This sum to be called the entrance fee, and to constitute part of the capital of the Society.

4. The Government promise to support the Society on the £ for £ principle as regards compensation in cases of deaths from epizootic diseases.

5. An annual premium of sixpence per ten pounds sterling value on all stock shall be payable by all members of the Society.

6. The sums subscribed as entrance fees and premiums shall be invested in Rhodesian securities in such manner as to be easily available when required for compensation purposes or payment of claims.

7. The working expenses, so far as possible, shall be paid out of the sums accruing as interest on the capital invested.

8. Only cattle that are regularly dipped are to be insured.

9. In cases of destruction of cattle, the skins and carcases of healthy animals shall be disposed of for the benefit of the Society.

10. The insurance covers risks only on cattle destroyed through, or that may die of, epizootic diseases.

11. The whole of Rhodesia shall be cut up into districts, and ten valuers appointed to each district. These valuers shall

be members of the Society. The appointments shall be made in such manner that two valuers are not more than ten miles away from any herd of insured cattle in the district. Two valuers will be necessary to assess the value of any herd it is proposed to insure. The valuers shall be paid for their services.

12. Owners must pay insurance premiums on all cattle possessed.

13. Only two-fifths of the value of the cattle insured shall be paid out in cases of death or destruction, two-fifths being also paid by the Government.

14. The Society shall pay out to members in cases of loss only on the certificates of fully qualified Government Veterinary Surgeons that the cattle have died of epizootic diseases, or on the certificate of such Veterinary Surgeon that the cattle were destroyed in the interests of the public.

15. The Insurance Society shall be managed in a business-like manner, and for this purpose a board of seven directors shall be elected from among the members.

16. A paid secretary shall be appointed by the board.

17. The Society shall build up a reserve fund as soon as possible.

18. So soon as the members shall consider it desirable, it shall be open to the Society to undertake further insurance of stock at fair premiums on other risks, such as the insurance of horses, mules, imported cattle, and valuable stock of all kinds, and also the insurance of cattle that may die of other diseases than epizootic, and accidents. It shall be understood, however, that the premiums on these risks will be arrived at with a view to profiting the Society.

19. Any profits made, over and above the amounts set aside as a reserve, shall be triennially distributed amongst the members of the Society, in such manner that any members joining after three years shall not participate in the profits of the previous three years. Such dividends shall only be payable for the extent of time within the three years that the member has joined the Society. It shall be understood that the entrance fees shall be considered the capital of the Society, and that dividends shall not be paid out of the capital sums.

20. As the premium suggested in clause 6 is sixpence per £10 value of each herd, it will be necessary for every owner who insures his cattle to obtain a valuation, by the valuers appointed by the Society, of the whole of his herd, and he shall pay his premium on the average value of his cattle, and should any die, he will receive compensation to the extent of four-fifths of the average value of the cattle in his herd, on each such animal that may die.

21. All cattle insured must be at least twelve months old.

22. Any member retiring from membership shall not be entitled to any refund of his entrance fees, but shall be entitled to his share of any dividend that may be accruing to him at the end of the triennial balancing of accounts. He shall not be entitled to any refund of his premiums. The cattle if sold shall continue insured, if purchased by a member of the Society, up to the date to which the premiums have been paid. If the cattle are sold to a non-member, the insurance lapses. It will always be necessary for all sales of insured cattle to be immediately reported to the secretary. There must be no restrictions in the rules of the Society on the sale of cattle, whether such are insured or not.

23. Any dividends that may become payable shall not be reckoned on the amount paid in entrance fees, but on the amounts payable and paid as premiums.

24. Breaches of rules, refusal to do what is ordered by the board of directors, frauds or attempted frauds, concealment of required information, false returns or all unfair dealing on the part of any member of the Society, shall render him liable to forfeit any compensation money that may become due to him.

25. The Society shall engage a fully qualified man to do the duties of a travelling inspector, inspecting all insured cattle.

26. In the event of funds becoming exhausted owing to excessive mortality, it shall be competent for the board of directors to levy an extra premium, but in no case shall such extra premium exceed the sum of one shilling per £10 value of all cattle insured. If this is not sufficient to meet all demands, the payment of claims may be deferred till such time as funds shall be available.



27. The voting powers of members shall be regulated as follows:—

Each member owning any number of cattle up to 50 head shall have one vote.

Each member owning any number of cattle up to 200 head shall have two votes.

Each member owning any number of cattle over 200 head shall have three votes.

28. No compensation shall be paid to any member who has been proved to wilfully have contravened any veterinary regulations which are law in Southern Rhodesia.

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THE GUADA BEAN.—On the outer cover of this issue of the *Journal* is an illustration of the Guada or Solomon Island bean which is being grown by Mr. T. Pretorius on his farm M'guta. The plant is not a legume, and in Australia the gourd, as it should be more properly termed, is highly spoken of as a vegetable if taken and cooked just before the seeds have set. The gourds are usually sliced and cooked like French beans, being served for preference with a white or butter sauce. The crop is considered suitable for all localities where marrows and pumpkins will grow, but though several introductions of this seed have been made, we do not know anyone else who has been so successful with the plant as Mr. Pretorius, and without irrigation results have not been very promising.

The Guada bean made its appearance with a considerable flourish of trumpets, but it seems doubtful whether it is likely to prove of any great commercial value in this country. As a stock feed it may be disregarded, and its sole use seems likely to be as a vegetable.

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HOP CULTIVATION.—The South African Breweries have for some years endeavoured to encourage the growing of malt-ing barley by the distribution of seed barley of different varieties likely to prove suitable to South Africa. They have now gone a step further, and have distributed a considerable number of hop “sets” for trial. Some five hundred plants

have been supplied to Rhodesian farmers by the Castle Brewery, Salisbury, and a valuable prize has been offered for the first bale of locally-grown hops.

The conditions are as follows:—A prize of £100 will be given for the first bale consisting of  $1\frac{1}{2}$  cwt. (168 lbs.) of hops grown in South Africa and delivered at any of the following breweries: Castle Brewery, Johannesburg, Bloemfontein, Cape Town, Port Elizabeth, Pretoria, Salisbury, and the Natal Brewery, Pietermaritzburg. The exhibit is to be certified by the head brewer and the local Government agricultural representative as suitable for the production of high-class beers. A short article dealing with hop cultivation will be found in the current issue of this *Journal*.

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**SHEEP IN RHODESIA.**—We would draw the attention of our readers to an article appearing in this issue written by Mr. Percy T. Webb, of Iron Mine Hill, dealing with this subject. Mr. Webb has been connected with sheep farming in South Africa for over thirty years, and his views, as the result of actual experience in Rhodesia, are of extreme value in the present stage of the industry.

It will be observed that Mr. Webb advises the beginner to start with a small flock, and in this connection it is interesting to note that a small flock of Merinos has been kept at the Government Experiment Farm at Gwebi for the past three years. The veld on this farm is naturally rank and long, and not suited to sheep. By beginning with a small flock, however, and mowing small grazing areas for the sheep as soon as the grass gets long, they have thriven, and the herbage on these areas has gradually become more suited to the sheep.

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**OUR IMPORTS.**—We have heard a good deal lately about the large sum of money which is sent out of the country yearly for foodstuffs which might be produced locally, and although the subject has been widely ventilated, we make no apology for referring to it here, for it is one which vitally affects the farming community of the Territory. The position

improved but little during 1913, but it is pleasing to note that the spirit of co-operation is gradually spreading throughout the country, and signs are evident that in various directions efforts to develop local sources of supply are being organised.

The Trade Returns for the year ended 31st December, 1913, shew that during that period we imported butter to the value of £25,883, of which £23,804 came from the Union. This is an item which we hope to see materially reduced in the near future. Our importations of eggs were valued at £9,874, of which the Union supplied £8,628, the total importations being considerably less than during the previous year. A good deal of interest is being evinced at the present time in poultry, which, with proper care, do particularly well in Rhodesia, and we may look for a substantial decrease in our imports of eggs in the not distant future. A good deal of fruit, both fresh and preserved, comes into the country, and our imports amounted to £25,191 and £12,558 respectively. Of these quantities, £17,621 and £6,832 came from the Union. Maize was imported to the value of £80,315—£47,967 from the Union—whilst we exported £24,014. Our imports of cheese amounted to £8,235, of which £1,211 was South African produce. Our bill for jams and jellies amounted to £10,195, of which £7,786 went to the producer in the Union; and for meats—fresh, frozen and preserved, including bacon and hams—we paid £56,074—£11,412 to the Union. A very considerable item in our import bill is flour, for which we sent £58,969 out of the country, more than half of which amount went to the Union. The very satisfactory progress made during the last few years in the growing of wheat in this country as a summer crop justifies the hope that before very long we shall be in a position to supply a great proportion of our requirements locally. We are very good customers of the Union as regards soap, for we paid them for this commodity £19,658. From oversea our imports of soap amounted to £5,004. Rice obtained from oversea cost us £22,320, and condensed milk £18,205.

The few items we have extracted shew the scope there is for local enterprise, and we trust that before very long we shall see the anomalous position that now exists considerably modified.



AGRICULTURAL SHOWS.—The following dates have been fixed for the various agricultural shows in this Territory: Gwelo, 20th, 21st and 22nd May; Bulawayo, 27th and 28th May; Umtali, 18th and 19th June; Salisbury, 2nd and 3rd July.

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A RHODESIAN OIL MILL.—Speaking at the recent Agricultural Union Congress in Bulawayo, Mr. P. Inskipp, Commercial Representative of the B.S.A. Company, definitely assured the delegates that it was the intention of the Company to erect in Salisbury, without loss of time, an adequately equipped oil mill, to work in conjunction with the Bacon Factory. This statement is of the utmost importance, since such an oil mill will prove of immense benefit to farmers throughout the whole country by providing a certain market for all the oil seeds they can produce. Without doubt, the most important of these crops is the ground-nut, owing to its great value as a rotation crop both for heavy and light soils, and also to the high feeding value of the fodder. After ground-nuts come sunflower, followed by linseed and castor oil. At present, however, it is uncertain whether the latter crops will prove sufficiently profitable to justify extensive cultivation. The yield of ground-nuts is well known, and there is little doubt that this crop will be most profitable, especially to farmers situated on the sand veld, with whom it will not improbably become a staple crop, replacing maize. The Department of Agriculture has been distributing seed of improved varieties of ground-nuts for the last three years, and there should now be a very considerable amount of this in the country. Growers who intend planting ground-nuts next season will be well advised to plant at least a proportion of their crop with improved strains. A further important aspect of the oil mill is the by-product in the form of oil cake, which will be a great boon to dairy farmers and stockmen generally. The success of the Small Holding depends very largely upon reliable markets at more or less staple prices. The establishment of a creamery, a bacon factory, and now an oil mill appears likely to provide such a market, and this coupled with an active policy of co-operation amongst farmers themselves, will do much to promote and hasten closer settlement.

## Veterinary Research.

### SOME FACTS AND FIGURES.

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By L. E. W. BEVAN, M.R.C.V.S.,

Government Veterinary Bacteriologist, Southern Rhodesia.

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While Rhodesia undoubtedly possesses great mineral and agricultural possibilities, it is probable that her future prosperity chiefly depends upon the progress of her pastoral industries.

A study of the progress of our sister Colonies bears out this contention. Take, for example, the history of New Zealand. On 19th November, 1814, the Rev. Samuel Marsden embarked on his ship the "Active" with a number of men, women and children, in all twenty-five, and with a cargo consisting of "a horse and two mares, one bull and two cows, with a few sheep and poultry." \* These formed the nucleus of her pastoral industry, although imports of sheep were probably made during the next few years. In 1858 she possessed some 1,500 horses, 137,000 head of cattle, and one-and-a-half millions of sheep. To-day she can boast of nearly half a million horses, two million cattle, and over 20 million sheep. The estimated value of the Dominion's dairy produce is about £3,000,000. Her total exports exceed £20,000,000 per annum, of which three-fourths are derived from pastoral products.

And again it is interesting to look at the early statistics of the live stock held in Australia when the country was first settled.

In 1788, Captain Phillip, in a letter to Lord Sidney, then Secretary of State for the Colonies, sets forth in detail the

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\* Letter from Marsden, quoted in his Life by the Rev. J. B. Marsden, 1858.

number of each kind of live stock in the country, and it includes one bull, four cows, one calf, seven pigs, and twenty-nine sheep. In 1880, one thousand cattle and six thousand sheep are recorded. At the present day there are in the Commonwealth over ten million cattle and about one hundred million sheep, and some two-and-a-half million horses. Australia produces from the farm and field over one hundred million pounds' worth of food products and clothing material yearly.

In 1913, the quantity of beef imported into the British Isles was 14 per cent. greater than had ever been received in any previous year. The supply from Uruguay was nearly double that of 1912, being roughly 400,000 cwt. Australian shipments shewed an increase amounting to 1,347,000 cwt., valued at about £2,133,000. New Zealand supplies were nearly 250,000 cwt., valued at roughly £393,000. The Argentine supply was the largest ever received, amounting to 7,000,000 cwt. The total value of imported cattle and beef for 1913 amounted to over £19,000,000, or 14.10 per cent. in excess of the corresponding total for 1912.

Although in 1912 more mutton was imported to Great Britain, the declared value for 1913, namely, ten million pounds' worth, was more by reason of the increase in price. Australia supplied roughly 1,600,000 cwt., value over £3,000,000. New Zealand's supplies exceeded two million cwt., of the declared value of £4,965,310. The Argentine supplies, amounting to over one million cwt., shewed a serious falling off of 36.42 per cent. since the previous year. The value of mutton and live sheep imported during the year amounted to £11,127,442; thus Great Britain paid in 1913 for beef and mutton over thirty million pounds.

Now, we must remember that Great Britain alone consumes over sixty million hundredweight of animal food per annum, and produces herself less than two-thirds of this amount, having to import the balance from overseas. Many of the supplies upon which she could depend in the past are no longer available, since they are being diverted to other markets. For example, America, as the result of more intensive farming operations and increasing population, is not producing enough meat for her own requirements. For the last



five years the quantity she has been able to supply Great Britain has reduced by a million pounds' worth per annum, and much of the supply from the Argentine, which would have made its way to Great Britain, is now being shipped to the States. On the Continent of Europe also the shortage of meat is becoming felt, and pressure is being brought to bear upon the different Governments to relax the protective tariffs, which were at one time imposed on imported food materials. New markets are springing up, as for example Japan, which is now an increasing buyer of meat and wools.

Thus there is a growing demand and a decreasing supply. The price of meat is increasing with alarming rapidity. With the disappearance of the old sources of supply new ones must be found, and therein lies Rhodesia's opportunity.

We are constantly being told that Rhodesia is pre-eminently a stock-raising country; this may or may not be true. In the early days of settlement it is said the country was heavily stocked with native cattle. Nevertheless, after twenty-five years of European occupation we find that the number of cattle in the country is officially estimated at 717,000 head, and these spread over an area of ninety-five million acres of land, less than one beast per 100 acres. And it must be recognised that the cattle which do exist are undersized, slow to mature, and would scarcely find a place in the world's markets.

It is also estimated that there are at the present time some 300,000 sheep and goats in the country, but these, generally speaking, are of a mongrel type, devoid of wool and deficient in mutton.

In a country which is supposed to be pre-eminently a stock-raising country, it is disconcerting to find that during the past year approximately £60,000 worth of meat was imported from without. Nevertheless, the confidence of stock raisers in the country does not decline, and we find it stated that wealthy companies, which have had wide experience of ranching in other parts of the world, are willing to take up large areas of grazing land in Rhodesia.

Now, let us consider some of the reasons for the unsatisfactory state of affairs which exists.

The explanation of the comparatively small numbers of cattle lies in the fact that twice, since the British occupation of these Territories, the cattle have been decimated by infective diseases. In 1896 the country was swept by Rinderpest, which attacked animals owned by white men and natives alike. The losses were enormous, and although no official statistics are available, it is estimated that less than 25,000 head remained. The disease invaded these Territories from the north, but swept through the country before proper means could be devised to arrest it. No organised Veterinary Department existed at that time, but a veterinary officer was discovered locally in the person of Mr. Chas. E. Gray, whose extraordinary ability and devotion to duty has since gained for him the honourable position of Principal Veterinary Surgeon to the Union of South Africa. It was not until the damage was done that systematic veterinary research was brought to bear upon the many problems presented by the disease. Rinderpest had previously caused great ravages in other countries, and desultory attempts had been made to obtain a means of coping with it by inoculation and by other methods of conferring immunity.

As a result of the appearance of the disease in South Africa, Professor Robert Koch was invited to the Cape Colony, in the hope that he might find a practical method of prevention and cure. His attention was first drawn to certain properties possessed by the bile of animals which had died from Rinderpest, the injection of which into normal animals was found to confer a certain degree of immunity. It, however, possessed certain disadvantages, in that it did not set up immunity until at the end of eight days, during which time animals could become naturally infected. Further, the immunity conferred by it was of short duration, lasting not more than four to six months. The method also necessitated the sacrifice of a large number of animals to provide sufficient and satisfactory bile for inoculation, which had to be used within four days of the time of its collection.

Edington improved on this method by mixing glycerine with the bile, which enabled it to be kept for months and perhaps for years. Large doses of the mixture could be injected



with safety, but it conferred only temporary immunising power, and had to be followed ten days or so after its administration by a dose of virulent material, preferably bile. It was necessary, therefore, to find some method of more general application.

Koch and others found that the blood serum of animals that had recovered spontaneously possessed certain properties which would render normal animals into which it was injected refractory. Bordet, Danys and Theiler devised a method of conferring immunity by the injection of immune blood into cattle which were afterwards exposed to natural infection with the result that they contracted the disease in a mild form and became subsequently immune. Kolle and Turner worked out a method at once simple and easily applied, which is now the one most commonly used, and is known as the "simultaneous method," from the fact that a quantity of protective serum is injected simultaneously with a dose of virulent blood. The serum is obtained from cattle which have recovered and whose immunity is increased by the subsequent injection of large quantities of virus. By this method the immunity conferred by the serum is immediate, but of short duration, and is completed by the re-action caused by the virulent blood. Thus is conferred a double immunity, which persists for several months.

In a few years this method of simultaneous vaccination has been extended to all countries ravaged by Rinderpest, and it has already rendered immense services to agriculture. It stands as one of the triumphs of veterinary research, from which even yet Rhodesia may derive incalculable benefit.

No sooner had the country begun to recover from the effects of Rinderpest than Pleuro-pneumonia presented itself. This is one of the most dreaded scourges of bovine animals. the virus of which is present in the serous exudate of the diseased lungs. As long as half a century ago a Dr. Willems, of Harsell, had discovered that if some of this material was inoculated into the tail it produced an inflammatory tumefaction which was absorbed in a few weeks, after which the animal became refractory to natural infection. This method was employed to cope with the disease, but with only partial success. Indeed, it has been stated by competent authorities



that in many instances the malady was disseminated by amateurs employing the virus in this way. Since that time great progress has been made in the knowledge of this disease, the micro-organism of which has been isolated, and can be artificially cultivated, so that a very much improved method of inoculation has now been devised. Nevertheless, Pleuropneumonia is a disease which cannot be too carefully guarded against. It was only eradicated from Rhodesia by what appeared at the time a greater disaster, namely, a further decimation of the cattle of the country by the introduction in 1901 of East Coast Fever, with a consignment of cattle shipped at Dahr-es-Salaam for Beira and Delagoa Bay. These were believed to be the balance of a large mob brought from the high veld in German East Africa to the coast. During the voyage a considerable number are reported to have died, some were landed at Beira, and some went on to Delagoa Bay, from whence they introduced the disease into the Transvaal. Those from Beira were sent on, some to Umtali and some to Salisbury. A disease broke out among both lots, and the ground upon which they were depastured became infected. Before the end of 1902 it had extended over most of the main transport roads in Rhodesia, and had invaded many farms adjacent to the roads. It was not until 1904 that the disease shewed any signs of abating, and this was chiefly due to the fact that most of the cattle on the infected farms had succumbed. The losses among native stock were comparatively small as compared with that among animals owned by Europeans.

The nature of the disease was not at first understood. At the commencement it was regarded as nothing more nor less than Redwater, akin to the Texas Fever of America, where it had been carefully studied and been found to be due to a minute pear-shaped animal parasite, met with in the red blood corpuscles of infected animals. On examining the blood of Rhodesian animals which died from East Coast Fever, such parasites were met with, and on *post-mortem* examination the lesions of Redwater were frequently encountered. Thus it was concluded that the animals were suffering from an acute form of Redwater, and as ticks which could transmit this disease were ubiquitous, it was thought best that it should pass through the country as quickly as possible, leaving behind an

immune race of stock. It was hoped that this might be accomplished with the same small loss experienced in other countries, *i.e.*, about 5 to 10 per cent.

It was not until the beginning of 1903 that Dr. Koch was able to explain the mistake. It was found that Redwater of cattle was to a great extent already endemic in Rhodesia. Animals born on Redwater veld contracted the disease in their early days; in fact, from the time when they were first bitten by an infective Blue Tick, that is to say, one which had previously bitten an animal containing the Redwater parasite. Such calves did not suffer from an acute form of the disease, but from a mild attack from which they recovered, and thenceforth became tolerant to the parasites, which they continued to carry in their blood throughout the rest of their life unharmed. But when this tolerance or resistance was reduced by any other disease, as it was in the case of East Coast Fever, the Redwater parasite was once more able to assert itself and to increase in numbers, so that it could be met with in preparations of blood examined under the microscope. Thus their presence, and the lesions of Redwater in cases of East Coast Fever, were accounted for.

But in these cases a second parasite, also in the red blood cells, was differentiated by Koch, and pointed out by him to be the definite cause of the disease. He also drew attention to the presence of certain bodies in the glands and other internal organs of the infected animal, which are now called "Koch's bodies," and have proved of great value in the diagnosis of the disease, and are made use of in a process of conferring immunity. Koch also endeavoured to obtain a method of protecting animals by serum inoculation, but his method proved unsuccessful. For this reason it has been frequently stated that so far as East Coast Fever was concerned Koch's mission was a failure, but this is not correct. It is true that no immediate results of practical benefit accrued from it, but the knowledge gained was of the greatest value, inasmuch as it opened up the way for research, which has since been followed with the greatest success by other investigators. As a matter of fact, there is probably no disease of which the fundamental principles have been more quickly determined. The life cycle of the causal parasite, its method of transmission and prevention, have been thoroughly worked out.



The course run by the disease in the animal from the time of inoculation till death may be divided up into three stages—a period of incubation, during which no parasites can be detected; a second period when the temperature becomes elevated and during which “Koch’s bodies” can be found in the glands, but no parasites in the blood; a third period when parasites invade the blood cells and can be taken up by ticks which engorge upon the animal.

The thermometer giving the first warning, a diagnosis can be arrived at in the second stage by the presence of “Koch’s bodies” in the glands, so that the animal may be destroyed before the parasites can reach the blood stream and it can thus become a source of danger.

It has been shewn that the disease is transmitted by certain species of ticks. Their life cycle has been so accurately studied, that it has become possible to deal with the disease with almost mathematical accuracy. It has been found that the Brown Tick during the course of its development attaches to three hosts; on the first as a larva, on the second as a nymph, and on the third as an adult. If the larva feeds on an infected animal, the parasite will be transmitted by the nymph. If the nymph takes up the parasite, it will be transmitted by the adult. Unlike Redwater, the disease does not pass through the egg. In no stage is the tick present for any length of time on its host, the larva and the nymph frequently dropping off within three days. Knowing this, Watkins-Pitchford devised his system of three-day dipping, which bids fair to remove once and for all the terrors of East Coast Fever, and, indeed, to revolutionise the stock-raising industries in South Africa.

In addition to these epidemics, there are other minor diseases which have helped to seriously retard the cattle industry. Although these are spoken of as minor diseases, it is probable that if a correct estimate could be arrived at they would prove to have been responsible for as great a loss as the epidemics already referred to.

First among these must be considered the Plasmoses, which affect all classes of live stock. In cattle, they are known by the common names of “Redwater” and “Gall-sickness,” the first being due to a Piroplasm, and the second to an Ana-



plasm, which has recently come to be regarded as a separate parasite.

In discussing East Coast Fever, it has been mentioned that indigenous cattle of this country, even when apparently healthy, harbour in their blood the Redwater parasites. If a small quantity of the blood of any such animal is injected into a susceptible animal, as for example one from Great Britain, or even one born and reared on tick-free veld in South Africa, it will be followed in about seven days by the symptoms of Redwater. Should the animal recover, a second elevation of temperature is manifested about the twenty-first day, and sometimes continues for as long as three weeks, during which time a small body is met with in the red cells. This is known as an Anaplasma, and causes a great destruction of the red blood cells, giving rise in some cases to a most intense anæmia, and in others to jaundice and discoloration of the tissues with bile pigment and the condition known as "Gall-sickness."

It is not proposed to deal at length with the symptoms of these diseases, but there are features of such practical economic importance that they must be somewhat fully discussed.

To simplify the subject, it may here be said that within recent years a specific remedy against Redwater has been discovered in Trypan-blue. This, when injected into the sick animal at the right time, destroys the parasite and leaves the animal immune. This discovery was made by Nuttall and Hadwen, and is another victory to be accredited to veterinary research.

The Anaplasmosis is not so easily dealt with, and does not respond to treatment, and while Redwater is comparatively easily eradicated by dipping, Anaplasmosis for some unknown reason offers greater resistance in this respect.

In a considerable number of ways the Plasmoses are a source of great loss to cattle-owners. At the present time they constitute the greatest handicap to successful stock-raising. It has been estimated that in different ways they are responsible for the loss of at least £1 a head per annum on every bovine animal in the country.

In the first place it is recognised that the indigenous cattle in the country, although hardy and prolific, are slow to

mature, and are undersized—many of them too small to be placed on the world's markets except as canned products. These defects must be rectified by the introduction of bulls of improved varieties. It is estimated by the Chief of the Animal Industries Branch that Rhodesia is at present short of over five hundred bulls for this purpose. But the importation of such animals from overseas is a matter fraught with such great danger, that only the well-to-do can afford to take the risk. If imported bulls become naturally infected, that is to say, by the bite of the Blue Tick (and it is only with the greatest difficulty that this can be avoided), it is probable that some 75 per cent. of them will succumb.

If, on the other hand, they are submitted to artificial inoculation, it is possible that the mortality may be reduced to about 20 per cent., but even then, those that recover receive such a serious set-back that their usefulness is retarded for a considerable time. Several of them prove altogether impotent and miss their cows, which are thus thrown out of use for the season; others get only weedy calves of delicate constitution.

As an alternative, there remains the introduction of bulls from the southern Colonies, where, however, they are not so numerous that many can be obtained. Moreover, it must be remembered that it is easy to put bad blood into a herd, but the most difficult thing in the world to remove it.

Or, again, it is possible to make use of locally-bred bulls of improved strain, but, for reasons which will be discussed later, these animals are rarely properly developed, and cannot be expected to compete with the animal of the same age from overseas.

Now, it has previously been explained that indigenous cattle of the country become infected in their early days, and do not suffer from a severe form of the disease; but in the young animal blood is required, not only for maintenance, but also for growth. If, therefore, the supply is constantly being reduced in quantity and quality by the depredations of a parasite, it is easy to understand that the calf must suffer. To a considerable extent the smallness of our native stock may be thus explained. In them the parasite does not produce acute



effects. It is to some extent held in check by their inherited powers of resistance. But in animals of improved breeding, that is to say, the product of imported sires, this inherited resistance is reduced, and the effects of the disease are more severe. In the more highly bred animals the mortality is very high, and on farms heavily infested with ticks, it may be as heavy as 25 per cent. Even when the disease is not the actual cause of death, it renders the animal so debilitated that it is subject to diseases which it might otherwise resist, as for example scour, pneumonia, and the condition which is locally known as "liver disease." Further, such animals are specially attractive to ticks, which aggravate the condition by constant re-infection, and even by the actual removal of blood.

Other causes for the small size of local animals are a disregard for the rules of breeding, improper feeding, and the long period of drought. Given, in addition to these, a disease comparable in many respects to the malaria of man, it is remarkable that animals develop as well as they do.

At the recent Fat Stock Show in Salisbury, the champion beast was a half-bred Aberdeen Angus bullock, 3 years 10 months, from an imported bull out of an Angoni cow, which weighed, killed and dressed, 650 lbs. The cup presented by the butchers of Salisbury for the best pair of slaughter beasts in the show was won by the same owner with the above animal and a heifer got by a half-bred Shorthorn bull out of a native cow. The heifer killed at 530 lbs. A native ox, at least five years old, scaled 600 lbs.

At a previous Agricultural Show in Salisbury in July, 1913, the selected best animals were: First, a half-bred Shorthorn-Angoni barren heifer, aged  $3\frac{1}{2}$  years, whose weight was estimated at 960 lbs., her dead weight being 552 lbs. The second prize was an Angoni ox, which was described as aged, the dead weight of which was 567 lbs. The animal placed third was a Mashona ox, live weight 1,095 lbs., which killed approximately 60 per cent., yielding 600 lbs. dead weight.

These must be regarded as exceptional animals, the first two, at any rate, having been got up for show; they were, therefore, far above the average. They compare very



unfavourably with show stock in Great Britain, where these weights are obtained by steers not exceeding two years old, and are frequently exceeded by ordinary butcher stock. The average carcase weight for Australian "station" cattle at four years is from 650 to 750 lbs. Therefore, the Rhodesian best is not above a low average for other countries.

To summarise, then, the losses from Anaplasmosis:—

1. Deaths of imported stock.
2. Shortage of bulls.
3. Impaired usefulness of stud bulls, arising from which (a) loss of service to cows, (b) unsatisfactory calves from the first year's service.
4. Heavy mortality of improved young stock.
5. Loss of growth and delayed maturity of all classes of cattle.

As the total result of the above, the figure already quoted, namely, £1 per head per annum, is not an exaggerated estimate of the financial losses occasioned by this disease, that is to say, the enormous sum of £700,000 per annum.

The question arises as to how best to cope with it. It is true that systematic dipping does improve matters to a considerable extent; where thoroughly carried out, calves thrive, develop better, and are not subject to so many secondary complaints. But it must be remembered that when ticks are totally eradicated from a farm, the live stock born and reared on it remain susceptible, and contract the disease when shifted from the clean area on to infected veld. Such a state of affairs has been effected on one or two farms in this country, and was brought to notice by the death of bulls sold to farmers on adjoining properties. Such tick-free areas are limited, the greater part of the veld remaining infected, and even with compulsory dipping, much of it must remain so, at any rate for a considerable time.

Until then the solution of the problem appears to lie in the discovery of a successful method of immunising, not only imported animals, but also young stock, which will thus be rendered immune, and will not suffer afterwards from the dis-

advantages associated with frequent sub-acute attacks. The system should be so simple that it can be applied by every intelligent stock-owner.

Sir Arnold Theiler has discovered a method said to have proved very successful in the Union Territories, but this is not so effective in this country, where a method will have to be devised by careful study and research.

Another disease which occasions enormous losses to this country is Horse-sickness. At the last census in 1911, it was shewn that out of 2,333 horses, 494 had died during the year, and of 5,169 mules, 578 had died, roughly a loss of £30,000. Of these deaths at least 75 per cent. were due to Horse-sickness. The smaller death-rate in mules may be explained by the success attending Sir Arnold Theiler's method of immunisation, and it was hoped that his method of protecting horses would by this time have proved equally successful. Unfortunately, it would appear from recent reports that this method is not yet sufficiently perfect for general application.

One of the greatest difficulties in connection with the preparation of an immunising process lies in the fact that the immunity conferred by one virus is not necessarily complete against another, so that in the words of the well-known saying, "a horse 'salted' in one district is not 'salted' in another." The same difficulty was met with in this country in connection with certain experiments which in other respects proved most satisfactory.

The Trypanosomiasis of man and animals are most important diseases in this country, not only from the point of view of the actual mortality occasioned by them, but by reason of the immense areas of valuable land which cannot be opened up and developed on account of the prevalence of the tsetse fly. It is estimated that in Southern Rhodesia some ten million acres, and in Northern Rhodesia about sixty million acres, must be regarded as "fly" areas or "potential" fly areas, that is to say, if not actually inhabited by tsetse, present those conditions which are necessary and favourable for the existence of *Glossina*. For it must be remembered that in the pre-rinderpest days, tsetse flies were plentiful in many places from which, for some unknown reason, they disappeared at

the time of the disease. These areas, therefore, must be regarded as suitable for the tsetse fly, which, indeed, during recent years has shewn a tendency to re-appear in them.

Laveran and Mesnil, in their classical work on "Trypanosomes and Trypanosomiasis," write:—"The extension of the Colonial Empires of European nations in Africa, the means of transport, and the growing facilities for ocean travel, will undoubtedly favour the spread of human Trypanosomiasis, of which a certain number of cases have already been observed among Europeans. On the Congo and in Uganda the invincible progress of Sleeping Sickness has been evident for several years.

"As to the animal Trypanosomiasis, the danger of their spread from the endemic areas is proved by a number of facts. This danger is increased by the development of commercial intercourse and the transportation of animals by sea, and also by the fact that the Trypanosomiasis of cattle and horses often run a slow and insidious course."

It is interesting for the purposes of this article to recall that the first Trypanosome was discovered in 1841 by Valentin, of Berne, in the blood of a trout. Between that date and 1880 the knowledge of these parasites did not greatly progress, but in the latter year a famous veterinary surgeon, Evans, discovered that the terrible scourge of horses and camels in India was due to a pathogenic Trypanosome. In South Africa, Bruce, in 1894, discovered the Trypanosome of Nagana or "fly disease" among horses, cattle, donkeys and dogs in Zululand, and cleared up the ætiology of the disease, shewing the role of the tsetse flies and of the big game, which act as reservoirs of the virus. During 1901, Dutton discovered a new Trypanosome in the blood of a European resident in Gambia, and in 1903, Castellani in Uganda found Trypanosomes in the cerebro-spinal fluid of negroes suffering from Sleeping Sickness.

Since then our knowledge of this class of diseases has greatly advanced, and at the present time some of the greatest pathologists are devoting their chief attention to the subject. But many fallacies and mistakes have arisen through the fact that these parasites and the diseases caused by them have been



chiefly studied in European laboratories, that is to say, in quite artificial conditions and surroundings, and it is now regarded as essential that they shall be investigated "on the spot" in natural circumstances. Given proper facilities for research, it is confidently believed that scientists will in the near future discover methods of eradicating the tsetse fly and preventing and curing the diseases transmitted by it; a consummation which will revolutionise the progress and development of the greater part of the African Continent.

Sheep have been previously referred to. It would perhaps be better if the greater portion of the ovine animals at present in the country were out of the way, since most of these are heavily infected with verminous and other diseases which they transmit to better quality sheep. Where they are present, and even on veld contaminated by them, any attempt at improvement is severely handicapped. Unfortunately the nature of these diseases is not properly understood, and very little research has been done in this connection, but it may safely be said that until this knowledge is obtained, Rhodesia cannot hope to take her place in the world's markets for wool and mutton.

The above statements would at first sight appear to deny the pre-eminence of Rhodesia as a stock-raising country, but to arrive at a true impression one must consider not only the great losses that the country has and is suffering through animal diseases, but also its marvellous powers of recuperation and the rapidity with which it has recovered from the various scourges to which it has been subjected.

During the past ten years the pastoral industries have undoubtedly made great progress, and the greatest insurance that this may continue lies in an efficient veterinary service.

In view of the calamities of the past, and the numerous diseases which still exist, it should be unnecessary to emphasise the importance of and urgent need for veterinary research in Southern Rhodesia.

# The Cultivation of Castor Oil Beans.

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Recent proposals regarding the establishing of an oil-crushing plant in Rhodesia have revived interest in the castor bean crop, and numerous enquiries on the subject have of late been received. Although castor oil bushes may be seen growing wild in many parts of the country, especially in the neighbourhood of deserted kraals, railway embankments, and such like, the cultivation of the crop on any large commercial scale has not yet been successfully undertaken. In spite of much experimental work in various parts of South Africa, the castor oil bean has not yet become accepted as a general farm crop, and it is well, therefore, to look for a reason for this. In the first place, there has often been a difficulty in disposing of the product, owing to the remoteness of existing oil mills; secondly, the crop has frequently been grown in localities quite unsuited to its requirements; and, thirdly, its success as a profitable commercial crop is not as assured as the uninitiated are apt to suppose. By the establishment of a Rhodesian oil mill the first disability will cease to exist as far as the farmers of this Territory are concerned, and with our varied conditions of soil and climate, it is not too much to anticipate that the crop may be found suited to at least some of the warmer and lower-lying districts.

In the countries where castor beans are most extensively grown, namely, India, Southern Europe, Mexico, and the United States of America, the crop is usually treated as a perennial, but occasionally in colder climates it is grown as an annual. The smaller seeded varieties, such as *Ricinus communis* and *R. sanguineus*, are usually annuals, while those

of the large seeded type such as *Ricinus zanzibarensis* should be perennials. In Salisbury, however, the large seeded varieties, when grown as perennial crops, have been found to succumb in considerable numbers during the first winter. In addition, it appears that some little injury must also be expected from the Castor Oil Stem Worm, the Caterpillar of a Fruit Moth (*Ophuisa cotella*), and a certain amount from Castor Oil Rust.

Numerous experiments have been conducted in different parts of South Africa during the last ten years in order to ascertain the acre-yield of castor beans. At the Experiment Station near Pretoria, in the Transvaal, the yield from a trial planting some years ago, and when the crop was grown as a perennial, was an average of about 1 lb. of beans per tree. These were trees of two to three years of age, and planted from 8 ft. to 10 ft. distant each way, giving 680 and 433 trees respectively per acre. It was found that the large seeded varieties (*Ricinus zanzibarensis*) cropped more heavily than the small seeded (*Ricinus sanguineus* and *R. communis*). Subsequent trials conducted during the years 1909-1913 on the Botanical Experiment Station, Salisbury, confirmed the yield of about 1 lb. of beans from every healthy tree, but, as has been said, in the second year many of the trees died out entirely. In 1913, an experiment was planned to ascertain the yield from the large seeded varieties when treated as an annual crop, planted in drills 4 ft. apart, the plants standing 2 ft. distant in the rows (5,000 plants per acre). In this case, however, many of the bushes failed to set seed, and the plot yield was at the rate of only 600 lbs. of beans per acre, or practically the same as that obtained the first year from bushes planted 8 ft. by 8 ft. apart (680 to the acre), and intended as a perennial crop. This planting, however, was too close, and 4 ft. by 4 ft. would not improbably have resulted in a heavier yield. Certain experimenters in the Hartley district, which lies at a considerably lower altitude than Salisbury, report much heavier returns, up to 3 lbs. of clean beans per tree being obtained, but these are only from small plots, while one farmer on the sand veld, who has grown castor beans for some years, has estimated his average return at 1,000 lbs. of clean beans per acre. Sir George Watt, in his "Commercial Products of India," records from Bengal an average annual return of



500 lbs. to 900 lbs. of beans per acre, while H. F. MacMillan cites the Ceylon yield under favourable conditions at 950 lbs. to 2,000 lbs. per acre. It appears fairly certain, therefore, that given proper attention a yield of at least 600 lbs. to 1,000 lbs. of beans per acre may be expected each year, either from a crop grown as a perennial or as an annual, and that in the former case, where successful, considerably heavier yields may be secured in subsequent years.

As regards the oil content of Rhodesian grown beans, analyses made by the Agricultural Chemist are re-assuring. A sample of the large-seeded, red variety, grown on the Botanical Experiment Station in 1911, shewed an oil content of 48.83 per cent., while a more recent sample grown in Matabeleland gave 51.1 per cent of oil. A consignment grown on the Northern Copper Co. Estates in Northern Rhodesia yielded 51.81 per cent. of oil. These figures compare favourably with those of beans grown in the countries previously referred to, where the average oil content is from 46 per cent. to 53 per cent. It may, therefore, be accepted that beans of sufficiently high quality can be produced in Rhodesia, and that, as stated above, the yield per acre will range from 600 lbs. to 1,000 lbs., and perhaps in certain cases even more. It remains to be seen whether the value of such returns will leave a sufficient profit after defraying the cost of production, how such yields can be increased, and, further, whether the annual or the perennial method of cropping is the more satisfactory.

The castor bean crop will grow on any soil of moderate fertility, provided it is reasonably well drained, but, as would be expected on the sand veld, except in favoured situations, the plants do not appear to attain the same size as on more fertile land. Since the crop requires a long growing season, seed should be planted as early as possible in November. If good rains have already fallen, it is well to soak the seed for twelve hours before planting, in order to hasten germination. The best distance for planting is as yet unproved, but the following, it is thought, may be recommended. Plant by hand in rows about 4 ft. apart, two or three seeds being dropped every 3 ft. or 4 ft. in the row. Where possible, it is advisable to check-row the seed, so that during the winter the

land can be cultivated both ways. When the plants are a few inches high they can be thinned out, leaving one plant to each hill. If the bushes make good growth during the first year, in the winter, after all the seed has been harvested, alternate plants and rows can be dug out, leaving the bushes for the second and subsequent years at distances of 8 ft. by 6 ft. or 8 ft. by 8 ft. apart. At the first spacing, 4 ft. by 3 ft., there will be something over 3,000 plants, and in the second year about 900 plants per acre.

Growth is at first rather slow, and if weeds are troublesome, one or two cultivations will be required, until the young plants are sufficiently tall to overcome the weeds. After reaching a height of a couple of feet the plants grow rapidly, and can then be left to fend for themselves until the first crop of seed is ripe.

Flowering and seeding with the castor oil plant is a protracted process, and whereas the first beans will probably be ripe in from five to six months from the date of seeding, the last picking will not be completed until July or August. If left too long on the trees, the seed capsules burst and the seeds are shed, consequently it is necessary to go through the field fairly frequently once the seeds have commenced to mature and to remove the clusters of seed heads before they become too ripe. Picking is best effected by natives carrying sacks, into which the seed clusters are placed as cut from the bushes.

The fact that the capsules burst and liberate the seeds can be turned to practical value as follows:—As the crop is harvested it is carted to a threshing floor, which simply consists of a hard-beaten earth floor, surrounded by sides about 18 inches in height, and composed either of wood, brick or iron. On this floor the seed heads are laid to a depth of several inches and left exposed to the sun's rays, occasionally being turned over with a rake or shovel. By this means the majority of the capsules will dry out sufficiently to liberate the seeds, and the more refractory ones can be beaten out with a light flail, care being taken, however, not to crack the beans. The next process is winnowing, to separate the broken capsules from the beans, and this is probably the most tedious operation in connection with the crop, since the size and weight of the



beans is not far removed from that of the capsules. As far as the writer is aware, there is no effective machinery obtainable for this operation, and for the present, therefore, it must be performed by hand. After proper winnowing, the beans are ready for despatch to the factory, where they can at once be passed through the mill without removing the husks.

When picking is completed, the bushes should be pruned, removing all dead wood and cutting back the main stems to within 3 ft. to 4 ft. of the ground. At this period, also, it is well to plough between the trees exactly as would be done in the case of an orchard. The seed capsules, after removal of the seed, have a certain manurial value, and these should, therefore, be spread over the land and ploughed under. The crop is an exhausting one, especially in respect of nitrogen, and it is, therefore, to be expected that where grown successfully as a perennial, liberal manuring every third or fourth year will be necessary. If grown as an annual, it should be rotated at comparatively long intervals. Kafir beans might well be used as a green manure crop, if drilled between the established bushes early in the season before the branches interlace.

In conclusion, a word of caution may be advisable. Almost all varieties of castor bean contain certain poisonous properties, though some are said to be innocuous. Some human beings, and also certain birds and animals, appear able to eat the beans without injury, but with others the effect of doing so may be most serious, and, indeed, perhaps fatal. Care should, therefore, be exercised, particularly where young children are concerned. The leaves of the plant are not considered to be injurious.

During the year 1913 the South African Railways alone consumed approximately 18,000 gallons of castor oil, rated at 2s. 9d. per gallon on rail at the coast; in addition to this, there are other extensive demands within the country, and also good prospects of a considerable export trade. With our present knowledge, it is impossible to say whether castor beans will ultimately prove a suitable crop for Southern Rhodesia or not, but it is one with which, since the demand is so extensive, farmers throughout the whole country may be well advised to experiment.



## Citrus Fruits.

### CULTIVATION AND PRUNING.

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By CHAS. E. FARMER, Citrus Adviser to B.S.A. Company.

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In an article in the April, 1913, issue of this *Journal*, it was stated that it is just as important to prepare the land on which the citrus fruit grove is to be planted as it is to prepare land for mealies or any other crop.

The writer wishes to call attention to this statement, and to add that not only should the land be ploughed and harrowed until it is broken into a fine tilth, but some kind of leveller should be used until the surface is free of mounds and depressions, and presents one uniform level. If this levelling is neglected, it will be the cause of much disappointment in the future, for without a level surface to work on, it is impossible to plant a grove with the trees at a correct depth. Those placed in the depressions may be only a few inches lower than the general ground level, but in course of time the surface of the grove will level up as cultivation goes on, and those particular trees will stand deeper than they would do if the levelling had been done before planting. This may seem a trifling matter, and not worth so much consideration, but in the course of time, and after much labour and expense has been incurred, it will be found that this is a matter of some importance. More fruit trees of the citrus family are stunted and retarded in growth, become deceased, very susceptible to the attack of scale insects, and made unprofitable by too deep planting than by any other cause. The reason for this is obvious. Citrus fruit trees are by nature surface feeders. The fibrous roots must have air from which, like the leaves, they take in carbonic acid. If at the outset these roots are deeply set in the ground they are stifled by the consolidation of the soil, and cannot perform their functions just at a time when they are most needed. The vitality of the tree is spent in trying to adjust itself to its new conditions, and it becomes stunted. In time a fringe of new roots may start away higher up the stem and near its artificially created surface level. But by

this time it is an unhealthy looking specimen, and if it improves for a time, will probably become diseased eventually, and will never be thrifty or a profitable investment. If the land is well prepared and the surface uniformly level, allowing, of course, for the natural slope, there should be no difficulty in setting the trees at the correct ground level if the planting board, as explained in the before-mentioned issue of the *Journal*, is used. When natives or inexperienced planters are employed, it may be advisable to instruct them to place the tree in the notch of the board with its ground level mark even with the topside, instead of the underside of the board, thus allowing the space of the thickness of the board for any sinking the tree may do owing to loose setting.

**CULTIVATION.**—No hard and fast rules can be laid down for the exact amount of cultivation to be given the grove, or for the exact time it shall be done, and the methods and implements employed to carry it out. These things must depend somewhat on the particular nature of the soil, on the peculiarities of the rainfall of each season, and must be determined by the individual grower for himself. Such questions present very little difficulty to those with knowledge and experience of general farming, although they may never have been growers of fruit. Citrus fruit trees will live and perhaps bear fruit of sorts although uncultivated and quite neglected, but without careful and regular attention to this detail they will not thrive or bear fruit which will be either creditable or profitable. No fruit tree responds quite so quickly to systematic cultivation, owing no doubt to the mass of fibrous roots feeding near the surface and their inability to perform their functions properly in a close, compact state of the soil. To provide these roots with the air they require and the air the soil requires to create nitrification, it is necessary that the surface should be loose and open. Cultivation is, therefore, resorted to as the means to obtain this result and also to conserve the moisture in the soil and prevent the large amount of evaporation which takes place from an uncultivated surface. It may be laid down generally that to keep the trees thrifty and in good condition it is necessary to stir the soil once every three or four weeks through the dry season of the year with a cultivator, which will do effective work to a depth of six or seven inches on the loam soils and to a rather less depth on the lighter sand



lands, keeping as far from the trees as the spread of the foliage extends, and crossing the work in order to do it thoroughly, and cover the whole surface of the grove. These cultivations, together with an occasional stirring of the ground with the ordinary hoe or Norcross hand cultivator (the kafir hoe is an abomination) immediately about the trees left untouched by the cultivator, may be considered the routine of cultivation in the grove from the time the rains cease until they begin again. In countries where these fruits are grown and damaging frosts are experienced, it is customary to cease cultivation before the end of the growing season, in order to stop growth and harden the wood before frost. This practice need hardly be considered in Rhodesia, frosts not being severe enough to be feared, except in the case of nursery stock and newly planted trees.

The method of cultivation to be followed in the grove through the wet season has been and still is a much debated point. The majority are in favour of growing a crop of some leguminous plant; others of allowing the natural grasses and weeds to take possession; while some advocate clean culture all the year. Their chief reason for the latter is that it reduces insect life. This may have its merits while the trees are going through their first year and less able to withstand the attacks of leaf-eating pests, but it is questionable, for even with clean culture the insects are there, if in reduced numbers, and the trees, being the only source of food, will receive their entire attention. Also clean culture carried on indefinitely is too exhausting to the soil. Where forest leaves and vegetable matter can be raked up in large quantities with a horse rake, and the surface of the grove mulched with them, as in some parts of Florida, the ground is partially shaded through the heat of summer and the decaying vegetable matter is a source of humus and fertility in the best form, reducing considerably the annual bill for commercial manures. This is ideal, but not open to the Rhodesian grower. The most practical and the most universal method and one attended with good results is that of growing a crop of a leguminous plant, such as some varieties of beans, cow peas, beggar weed, etc., between the rows of trees, ploughing it under, of course, in a green state, and before seeding begins. The planting of this crop should be timed if possible to permit of the ploughing being done well



before the rains cease for the season. The surface may be left rough and uncultivated, which will allow of the remaining rainfall being taken readily into the land and the vegetation turned under given a chance to rot before the last rains are over, when cultivation must be resumed. It is the nature of most of the soils here, and especially the heavier loams, to harden on the surface and crack in a short time after rains cease. It is important, therefore, that this annual ploughing should be finished, and the cover crop at any rate partially decomposed, before the necessity for cultivation arises, otherwise cultivation must be postponed, which means a loss in the conservation of the recently stored rainfall; or it must follow close upon the ploughing, which means the dragging to the surface of the unrotted cover crop. This practice of making the annual ploughing of the grove the occasion for turning under vegetation is especially to be recommended on the granite and sand lands, which are more particularly deficient in the food elements supplied to soil in this way. And for all soils the practice seems one to be recommended where a sufficient quantity of barnyard manure and forest leaves is unobtainable and chemical manures expensive. This subject of the cultivation of the grove may, therefore, until experience of local conditions teaches something better, and assuming the rains to begin in November and end in April, be taken to necessitate at least six workings with a heavy tine cultivator for the stiffer soils and a lighter one, or perhaps with the Acme harrow, for the light sand soils, with three hoeings immediately around trees, and the sowing of a cover crop and an annual ploughing (for preference with a mould board plough) early in the month of March.

PRUNING.—No branch of the culture of citrus fruits is quite so puzzling to the beginner as this vexed question of pruning. He finds little or no relief from trying to obtain information from books, because little or nothing has been written about it until comparatively recent years, when this industry was taken up as a commercial business in the United States of America. Information was then disseminated by degrees through the medium of pamphlets issued from time to time by their Agricultural Department as the result of experiments, but much that was contradictory to this was published in articles from time to time written by individual growers to

the newspapers devoted to such subjects. It is no wonder that this question is sometimes settled in that most comfortable way of all by persuading oneself that no pruning is required. However, there is less harm done by following this easy way of settling the matter than is done by the too busy man who thinks he will at any rate give the trees a nice symmetrical appearance and lops off from the outside any protruding growth as severely but without the method he may have seen applied to deciduous fruit trees. The orange tree requires pruning, but not so severely, and the agreed method of going to work is the reverse of that required by most of the deciduous fruit trees. Given a sound, healthy tree, without deceased wood, the object of pruning it at all is not to shape it in the sense that apple, pear and peach trees are shaped to suit popular methods of growing them and cultivation. The orange tree will shape itself without the aid of this hard cutting back and the shortening of limbs—in fact, it cannot be subjected to an annual dose of this treatment, which is so opposed to the nature of the tree, without becoming stunted and deceased. The object to be attained is merely to remove deceased limbs and any which cross and rub others, as well as such small limbs and twigs from the inside as the tree has ceased to need as a protection to its trunk from sun and wind, and which darken the interior and prevent the free circulation of air sufficiently as to cause this inside growth to become unhealthy and useless for the production of fruit. In that state it is merely a drain on the vitality of the tree, and reduces its power to utilise its resources in the formation of new growth and limbs where they would be beneficial in increasing its size and bearing capacity. This unhealthy inside growth is the great attraction the tree has for the various forms of fungi and scale insects, and it is on this growth that these pests first establish themselves and obtain a foothold in the grove. Every orange tree, whether budded or seedling, after it has reached a large enough size to form a dark interior will be found to have more or less of this superfluous inside growth, which was made by the tree in its younger stages for its own protection, but the use of which it has out-grown. The extension of the main lateral limbs and the dense mass of their foliage and fruit-bearing wood now afford the necessary shelter and shade to the trunk, but at the same time the sunlight and air are



cut off from the inside growth sufficiently to prevent its foliage from performing its proper functions of absorbing the carbonic acid of the air and assimilating the food materials taken in by the roots. This results in the wood of the superfluous inside growth becoming dry and hard, and its foliage sickly and undeveloped. In time, if left alone, this growth dies bit by bit, and remains in the tree until so dry and brittle that it falls off and disappears. This is nature's method of pruning, but for years before she accomplishes the task the healthy portion of the tree has borne the drain of supplying food to an ever-increasing amount of this sickly, unprofitable growth, which must eventually die. If nature is anticipated and this is removed by the pruner as soon as its usefulness has ended, it ceases to be a drain on the reserve forces of the tree, which forces are more profitably used in the further extension of the lateral limbs, and consequently increasing the bearing space. To fully realise this, let the reader take the first opportunity he has of examining the interior of a seedling orange tree which has never been pruned, and is of seven years old and upwards. He will find a dense mass of dead twigs and small limbs, and many more with the foliage undersized and yellow, and the wood hard and dark in colour, instead of grey-green, the natural colour of healthy orange or lemon wood. The unpruned budded tree will not become so choked with useless growth perhaps as will the seedling, but a certain amount will be found there. It is intended to be understood from the foregoing that until a budded orange tree (and we may at once dismiss the seedlings from consideration, as they are not now propagated for commercial purposes) has grown large enough, and by the extension of its lateral branches has formed a head so dense that inside growth is deprived of air and sunshine to such an extent as to render it unhealthy and unprofitable, and nature commences her slow method of pruning, there is very little that the pruner can do except to remove any shoots that spring from below the union of the bud and the stock. As the young budded tree comes from the nurseryman and is trimmed back ready to be planted in the grove, it consists of little but a small stem with a few small twigs. As it commences to make a new root system it also sends out shoots correspondingly at intervals from the stem; these shoots may be very numerous and even come in pairs.



These should all be left on the tree, only those starting from below the union being removed. Certain ones may take the lead and grow so quickly as to be unable to support their own weight in their young sappy state; these leaders may be given support by tying them to the stem just enough to keep them from blowing off or falling down and resting on the ground. When growth stops and the wood hardens, they will usually support their own weight. These shoots will form the lateral branches of the future tree. There may be many more than will ultimately be required for this purpose, but at this stage of the tree's history they are all useful to supply shade and protection from wind to the stem, and by the help of their leaves to elaborate the sap taken up by the roots and enable the tree to supply material for adding to its parts.

The writer does not wish to be understood to lay down a hard and fast rule that no growth whatever is to be removed at this stage. No two trees grow alike, and exceptional trees may be benefitted by the removal of some growth during the first two or three years in the grove. Or if it is possible to obtain from the nursery two-year-old buds on four-year stocks with lateral branches already selected and established by the nurseryman, his selection can be preserved and encouraged by the removal of lateral shoots appearing after transplanting. But the writer is not aware of the existence of a nurseryman in South Africa supplying trees of this age and strength, and he is endeavouring in this article to meet Rhodesian conditions.

After the first two years in the grove, the trees will be sufficiently advanced to enable the grower to exercise his judgment as to what growth to remove and what to encourage as a permanent branch, endeavouring to preserve the balance of the tree by lateral branches leaving the stem at intervals as evenly as possible on all sides.

It is the aim of present-day fruit growers to make the low-branching, wide-spreading tree from which fruit can be gathered quickly and economically by the use of steps and not ladders, and a tree which can be controlled easily with the spray pump. It is a matter of individual taste as to the exact height from the ground the tree should fork. It is immaterial, in the writer's mind, whether the tree preserves a solid trunk for one foot or two feet before it branches. The object to be aimed at is the same, that is, the low-growing, wide-spreading



A six-year-old Orange Tree at Premier Estate, Umtali.



Citrus Grove, Premier Estate, Umtali.





tree. When the time for fruiting arrives, the lateral branches will be bowed by the weight toward the ground, getting lower as the weight increases with the growth of the fruit. The season's growth of new wood will take the form of strong shoots starting away from the arch of the original shoot or lateral limb. This in its turn will also be brought down, and the same process repeated. In time what was the end of the original lateral branch will be a mass of foliage sweeping the ground, the later shoots having formed a continuation of the branch and extending out and over it. When this low-lying portion remains, after the removal of the fruit, touching or nearly touching the ground, it is time for pruning to begin in that direction. This portion of the lateral branch should be removed by cutting back at the point where it forks with the next later growth. By a repetition of this process, the lateral branches are always extending out further, and the tree assuming the desired shape. Citrus fruit trees should be pruned in the spring as soon as convenient after frosts cease, and not in the autumn and winter. If they are looked over once a year at this season, it is quite sufficient. What are commonly known as water sprouts should only be removed when they start low down on the trunk, at a level where new lateral branches are not required. They should not be cut out just for the sake of doing it. They are the commencement of the formation of new branches, and that is the tree's method of increasing its size, and goes to shew that the tree has the reserve force and vitality to do it.

In pruning old trees which have been neglected, take out deceased limbs and those which cross and rub others, always removing them entirely by cutting back to the trunk or where they branch away from some portion it is desirable to retain. It is important that stubs should not be left in the tree, but all branches cut close, and a little into the trunk, to enable the new bark to close over quickly. A mallet and chisel are the best tools to use for this purpose and to avoid leaving bumps on the trunk.

The foregoing applies more particularly to the orange tree. The lemon, owing to the more straggling nature of its growth and the tendency of its branches to break under the weight of fruit, requires more severe pruning, and the entire removal of some portions of the lateral branches.

## Farms and Farming in Rhodesia.

THE DISTRICTS OF BULAWAYO, NYAMANDHLOVU  
AND BUBI.

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By ERIC A. NOBBS, Ph.D., B.Sc.

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The railway between Bulawayo and Gwelo, as all travellers know, follows the watershed of Rhodesia dividing the valley of the Zambesi from that of the Limpopo. To the south and east of the railway lie the districts of Umzingwane and Insiza, and to the north and west of the line the districts of Bulawayo, Nyamandhlovu, Bubi and Gwelo extend over an area of 19,003 square miles, whilst more remote still lies Sebungwe and Wankies, covering 26,062 square miles of territory. The crest of this enormous divide consists of bare, wind-swept uplands, treeless almost on their eastern aspects, and with thickets of scrub on the more sheltered western slopes. Springs are, of course, scanty on the watershed, and only the sources of the rivers are seen. As the country gradually falls its character changes. The granite of the high ground gives place to sandstones, shales and schists, each furnishing its characteristic type of soil or blending in alluvial valleys to furnish patches of fertile ground, often with possibilities of irrigation. The open veld gives place to tree-strewn savannahs, then to bush-veld, and at lower levels further from the line to forests of mopani, teak, thorn and fan-palms, with open glades and long, grassy valleys, and finally passes into the low, flat country approaching the great Zambesi River. No great mountain ranges intervene, though the altitude at Insiza is 4,640 feet, and at the Victoria Falls 2,994 feet, above the sea. A number of parallel rivers traverse this tract of country in

a north-westerly and westerly direction, the Gwaai, Khami, Umgusa, Bembesi, Inkwekwesi, Shangani and its tributaries, the Vunga, Gwelo, and the Karna Rivers, all eventually joining the first-named, and ultimately the Zambesi.

Recent returns have been collected of cattle owned by Europeans in these districts, and they all shew a notable increase since the last census was taken, and a total of 32,512, of which two-thirds—actually 22,443—are owned by Europeans. The Bubi district was the first to adopt the permissive provisions of the Fencing Ordinance, compelling neighbours to share the cost of mutual fences, and since then this beneficial measure has been applied to nearly the whole of Gwelo and to large portions of Bulawayo and Nyamandhlovu, as well as many other areas beyond the limits of the districts now being dealt with.

Farming is progressive and well-conducted in these districts. The majority of farms already possess dipping tanks, the merits of which have been realised by experience with several outbreaks of coast fever, all happily overcome. Similarly, farmers now know the value of ensilage, and pit silos will be found everywhere in general use. Again, recent dry years have led to the sinking of wells and boreholes, and farmers appreciate the great advantage of watering stock in troughs, instead of in mud holes in stagnant rivers or vleis. Polluted drinking water is a fruitful source of infection, both for human and animal diseases, and trough watering, whether the water is led from a fenced-off dam, pumped from a river, drawn into tanks, lifted from a well by bucket pump or other means, is always to be recommended for these reasons. It is also more economical as regards the consumption of water, as none is fouled. Wells, more or less elaborate, as shewn in the accompanying illustrations, according to purse or purpose, can be established at various points, thus saving the stock much unnecessary walking, which, especially in winter, means loss of condition, a decreased milk supply, and probably the loss of sundry head.

To a great extent, each of the rivers mentioned above as traversing these districts has characteristics of its own, and for descriptive purposes may be dealt with separately. The



Gwaai rises close to Figtree Station, and, excepting near its sources, passes mainly through unoccupied country and native reserves. It is, for the greater part of the year, a sand river, a dry bed in which the water flows under the surface, and only appears in pools and lagoons where a bar of rock across its path holds it up. It is somewhat remarkable that, whilst the valleys of its tributaries should have long been settled, and now contain numerous groups of flourishing farms, the Gwaai itself has but few dwellers along its banks. For some distance above Gwaai Station, on the left or western side, there are long alluvial stretches of considerable fertility between the river and the Gusi forest. These flats consist in part of a fair sandy soil, in part of very rich, deep silt, carrying luxuriant sweet grass, camel-thorn and sweet-thorn trees of great size. Unfortunately the Gwaai River in its wide sandy bed offers little scope for storage of water for irrigation schemes, although suitable sites may one day be found. Surface water being scarce—although by sinking shallow wells enough could readily be secured for man and beast—the natives have collected near the river, in the sand of which they scoop drinking holes, instead of scattering further over their reserve. The absence of homesteads along the Gwaai, although little unalienated land remains, is perhaps attributable to this deficiency of surface water, although with modern means of well-sinking and boring, there is little reason to allow this to deter occupation. Another drawback is the presence in places of the “Kauzaan” or “Umkauzaan,” the “Gift-blaar” of the Dutch (*Dichapetalum cymosum*, Hook, Engl.), a poisonous creeping plant, which occurs chiefly on the sandy soils of Gusi forest, and which, especially in the beginning of the season, is the cause of considerable mortality amongst stock. It appears to act most virulently immediately after stock have drunk water. The effect is then so rapid that remedies can seldom be applied in time. The best known treatment is a strong purgative, followed immediately by a stimulant, such as brandy or black coffee. Mustard and vinegar are regarded as a safe cure if promptly administered, and the animal must be kept away from water until the medicine has had time to operate, say, for ten hours or more. This dangerous herb is to be carefully avoided, particularly at the season when it first appears and when other green stuff is scarce. It occurs in

these western districts of Rhodesia, and in Bechuanaland, and the bushveld of the Transvaal.

The Khami runs in a deep bed very different to the Gwaai, and often disappears for some miles, so that it is only a flowing river in parts, although it is in evidence for a longer time than the sand-choked Gwaai. The main line crosses the headwaters of the Khami at a siding of that name a short distance to the south of Bulawayo, in the vicinity of which lie several farms, notably the Alnwick Estate, lately cut up with a view to making it into a number of small farms; Klipspring, the well-chosen farm of Mr. Brewer, on the site of a kraal of one of Lobengula's queens; and Mr. C. R. English's farm, at Khami, where are to be seen over 250 good Friesland cows, the milk from which is sent daily to Bulawayo, eight miles away. Here is to be seen a bull of the same breed—according to appearance and pedigree, and judging by his progeny, one of the very best of his kind in Rhodesia. The well-known Khami ruins, the resort of tourists and antiquaries, are in this vicinity.

The railway from Bulawayo to the Victoria Falls follows for some distance the valley of the Khami, and approaches very close to it at Redbank, where there is a group of occupied farms. Another large milk producer is located here—Mr. Betts, of Bonisa—who, besides owning a large mixed herd consisting mainly of Friesland and Shorthorn grades, has some nice specimens of that useful dairy breed, the Ayrshire, which is so rarely found as yet in Rhodesia. On this farm there is an excellent irrigation scheme, and its closeness to a station also gives it unique advantages. Near by are the homesteads of the farms Carlsville and Inkukū, giving this piece of country a most settled and prosperous look which is not belied by appearances, as not far off there are several other good farms, including that of Mr. S. F. Townsend, at Coplestone, where a great deal of activity is being displayed in developing a fine property, and the sub-divisions of the Helenvale Estate, so that quite an important rural community has arisen at this centre.

Further down, with Nyamandhlovu as a station, there is a number of farms, including some of the best and longest



occupied in Matabeleland; for many rights were pegged here in 1893, and some have been occupied ever since.

Mr. Dan Vincent has been established on Serui since the earliest days, and near by on Redleaf, Mr. Morgan has also been farming successfully for a long time. A number of new farmers have come into the district during the last four years.

An enterprise of peculiar interest is being pursued by Mr. Parry, on Enyogeni, and Messrs. Creighton and Bowe, on Moonto, who have jointly made several tons of Cheddar cheese of excellent quality, which has been sold and consumed in Bulawayo. Situated too far from the railway for despatch of milk or cream in summer, they have found this a practical and profitable undertaking, and they may be regarded as the pioneers of a promising industry in the Territory.

Another notable farming venture is that of Mr. St. C. B. Gwynn, on Edwaline and M'pandene, farms where, besides mixed farming on a large scale and tobacco, there is a choice herd of North Devon cattle. In this vicinity, too, Messrs. Dechow and Tweedale hold a number of farms worked as a ranch, where cattle obtained from the other side of the Zambesi are being graded up with Shorthorn and Friesland bulls.

On an eminence commanding an extensive and unique view, situated at the very junction of the Khami and Gwaai Rivers, Mr. Jowett enjoys the distinction of being the last farmer in that direction for many hundreds of miles, for to the west lie native reserves and unalienated land up to our border, and beyond that, Bechuanaland and the Kalahari. The country around Nyamandhlovu is very diversified. The main rivers and their tributaries form the vital features, and near them is to be found rich land, situated in chocolate and black vleis, and on alluvial flats. In evidence also is good red ground, appropriate for arable farming, which in favoured spots may be followed in its most intensive forms by growing tobacco, vegetables for towns and mines, particularly Wankies, and green crops for dairying, both under rainfall and by irrigation. Further back are sandy ridges, covered with forests containing, amongst other timbers, the so-called teak, much sought after both for its beautiful appearance and useful



qualities. The back blocks are suited essentially for cattle running, and could be much improved in that respect by fencing and by supplying watering troughs and wells every three miles or so apart.

Quite different from the rivers hitherto referred to is the Umgusa, which rises on the borders of the Matopos, and is crossed by the railway whilst still an insignificant periodic spruit a short distance to the north of Bulawayo. Besides watering a number of large farms, it passes through a cluster of smaller holdings of considerable value, on account of their proximity to the town and the availability of a water supply from the river, which can be used either for irrigation or for stock. Dairy farms such as Umgusa, Umvutcha, Good Hope, Keendale, Eagle's Nest and others naturally predominate; and it is interesting to observe how this locality, which was one of the first to take up tobacco growing seriously, has virtually abandoned that crop in favour of milk, which brings in good and quick returns, and for which these farms are remarkably suited. The recent dry seasons, favouring a high price for milk and adverse to the tobacco crop, have influenced this result, but the river is the main cause. There is room for much more extensive utilisation of the Umgusa River. The banks, however, are steep and high, and water would be required to be raised considerably in order to bring it on to the land, but sites for weirs are plentiful.

On the farm Lower Umvutcha, Mr. Walker runs a small flock of woolled Persian sheep, direct descendants of the original animals imported *via* East London some years ago, and which have been proved to possess extraordinary qualities of rapid growth and large size.

As the distance from Bulawayo increases, so the extent of the farms becomes larger. One of the best and most advanced of these is Devonby, the property of Mr. C. S. Jobling, an excellent mixed farm, where special attention has been given to tobacco and to cattle raising. Here Mr. Jobling has a small pure-bred herd of Herefords of high quality. Other supporters of this breed are to be found in the locality, notably Mr. G. Mitchell, on Spring Grange, and Messrs. C. and W. Beamish, of Hildaskraal. A visit to any of these herds is a convincing

proof of the merits of the breed and of its suitability to parts, at least, of Rhodesia. Beyond these farms lie many privately owned blocks, not occupied except for a few cattle, and ranches such as the Cawston Block, on which cattle raising alone is being actively followed. The Gusi is here dominant, and timber in one form or another forms an important element in the potential wealth of the district.

To the north of the Khami River, and stretching across to the Bubi, is a large tract of Gusi country, running out to a point near Thabasinduna. The prevalence of the "Umkau-zaan" (poisonous plant) on this belt deters occupation, and its chief value for the present probably lies in its timber resources and the possibilities of afforestation. For the most part, this land is held by companies and syndicates.

The neighbourhood of Heany Junction is not worthy of mention. The dominating feature of the landscape is Thabasinduna, a hill of tragic associations, with the peaked Maxim Kopje close by, names which sufficiently indicate the historic interest which attaches to them. These hills are of totally different aspect to the granite Matopos or schistose Mulungwane range, and form the easternmost outliers of a formation which covers a vast portion of this side of Rhodesia, comprising the forest sandstones and coal-bearing beds of Wankies and Mafungabusi, the edge of the main mass of which is visible as a line of flat-topped hills on the western horizon. A recent development in this neighbourhood of much interest to farmers as well as to miners and to townsmen is the Premier Cement Company's factory, now in course of construction on a private siding, the raw materials for which will be brought by a branch line from a spot some few miles to the eastward.

On the Imbesu Estate of 24,000 acres, Mr. Aserman is conducting farming operations on a large scale, including a steam ploughing tackle by Fowler & Co., the first of its kind in Matabeleland.

On several farms in this neighbourhood, such as Imbesu Park, Maxim Hill and Three Fountains, a considerable amount of arable farming is being done, but the dryness of recent years has been so unfavourable that stock-raising has more and more





Watering Troughs and Tanks on the Wynyssley Estate.



Watering Troughs supplied by Bucket and Windlass from a Well.





come to the front. Cattle do remarkably well in these parts, and dairying for the purpose of supplying cream to the butter factory is likely to prove profitable. For these reasons crops other than maize deserve special attention, and by degrees the use and value are being learnt of such crops as Napier's fodder, paspalum, teff, mangold, dhal, cattle melons, velvet beans and linseed, although there is still room for expansion and improvement in the variety of crops sown. Fencing is general; indeed, this is one of the best fenced portions of the country. The value of fencing has been realised by the rigours of Coast Fever, while a great stimulus has been given by the introduction of the Fencing Ordinance.

On the farm Driehoek in this vicinity, Mr. W. V. Fleming has been trying ostriches of both local and southern breeds, but without as yet very conspicuous results. On an adjacent farm, Imbesu Kraal, Mrs. Austin, has been eminently successful for many years in raising poultry, the favourite breed being White Leghorns.

The next river to be considered is the Bembesi with its tributaries, which drain one of the finest cattle districts in Rhodesia, especially favoured in that it has sweet veld, is well watered, well drained, and nicely sheltered. The mines in this vicinity—the Queen's, the Athi, and Elumba—furnish a local market for grain and perishables, but cattle must remain the chief source of wealth. Two notable breeders of Africanders, Messrs. Fynn, of Bembesi Valley and Induba, are located here on fine farms. Further out at Braemar Estate, where Mr. V. Goff Ewing owns 36,000 acres of land occupying both banks of the Bembesi River, and at Wynyale Estate, the property of Mr. C. W. Adams, consisting of 24,000 acres, situated on the Inkwekwesi River, cattle raising on ranching lines is carried out. The illustration, shewing watering troughs and four tanks, is from a photograph taken on this ranch. The water is raised from a borehole 75 feet deep, yielding on testing 50,000 gallons per day, and the tanks have a joint capacity of 20,000 gallons, so that provision is made for a good many cattle, even in calm and dry winter weather.

Another large cattle owner on the headwaters of the Bembesi is Mr. Walker, of Greenlands; whilst on the Lochard

Block (38,000 acres) near by, the Mashonaland Agency run over a thousand head of cattle under the management of Mr. H. P. Robertson. This is the only company in this part of the country engaged in stock raising, the other holdings all being in the hands of individual owners. A further noteworthy fact is that many of these undertakings are of recent origin, having only been actively taken up during the last couple of years. So far, they are all very successful, and as there is still much unused land in this vicinity equally suitable, it augurs well for the future of this region, which competent authorities have described as containing some of the best cattle country of Rhodesia.

The Native Commissioner and District Surgeon for the Bubi district reside at Inyati, and here also are located the Post Office, Police, and Cattle Inspector. In the neighbourhood are a number of flourishing farms, where stock-raising is combined with arable farming, such as Huntsman and Portive, owned by Mr. H. H. Williams; Hurst, by Mr. D. E. Williams; Robins, by Mr. Streak; and Croome, by Mr. G. H. Huckles, who is the oldest farmer in the district.

Beyond the Inkwekwesi River in this direction we enter upon great stretches of flat country covered with scrub, which is a drawback, on account of the arduous labour of removing it before any ploughing can be done, although when cleared the soil is good and the veld sweet, thick, and plentiful. Surface water is very scarce, and the district must for its development depend on wells and boreholes. The Lonely Mine is a good market, and there is every likelihood of numerous small or moderate sized farms springing up round it, as some have already done. From everything else other than this mine, however, settlers are very remote, and the country to the northward will probably for many years to come be best utilised for ranching, for which it is singularly well adapted. West of the Lonely, along the Bembesi and N'dutja Rivers, is some good country, only sparsely occupied as yet, where mixed farming might be profitably followed.

Eastward and north from Inyati across the Inkwekwesi River for thirty or forty miles the whole country is held in large blocks, for the most part by companies or syndicates, and



is not utilised, although it possesses great capabilities for stock farming, and in parts suitable areas for cultivation. Here the underlying rock is in part granite, carrying a thinner but distinctly good open veld, with clumps of bush and plentiful water; in part there is a schist formation, with shorter, dense grass, which has a rather higher stock-carrying capacity, whilst the low scrub gives place to larger trees, knobby thorn and mimosa being plentiful. This fine country, which must no doubt be occupied profitably before long, merges into the valley of the Bubi, the whole length of which is pegged off in large blocks, at present unoccupied. The high veld conditions gradually give place to a different type, lower, warmer, more densely wooded with scrub, mopani and gusi, until at length the whole country is wooded except for open glades or vleis of varying extent. Being unoccupied, this portion calls for no further comment.

Of the next big river, the Shangani, the same may be said as regards the left bank, for, with the exception of one or two farms and the Eclipse Mine, all near the station of that name, there is no occupied land on this side below the railway bridge.

## Sheep in Rhodesia.

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By PERCY T. WEBB.

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The future for the sheep farmer in Southern Rhodesia is, I am convinced, a great one. Already tentative steps have been taken by many farmers in the direction of sheep breeding, and, so far as I am aware, the results have been almost uniformly satisfactory. My own experience has certainly given me great confidence, and I believe a very considerable industry, both in mutton and wool, will grow up. Already some of the larger companies, which have previously confined their attention solely to cattle, are making enquiries with regard to the possibilities of sheep breeding, and if the railway concessions, viewed so favourably by Sir Starr Jameson on the occasion of his recent visit to Iron Mine Hill, are brought into being, there will inevitably be a large influx of pure-bred stock from the south, and possibly also from Australia.

My own connection with sheep farming extends over thirty years, beginning in Natal, where I still retain my farms, in addition to continuing operations in Rhodesia. For the first fourteen years I had none but South African-bred merinos, but since that time I have used imported strains alone. I have never had anything to do with any other breed than the merino, and any remarks I may make will apply solely to them.

On no account do I wish to assume the role of the veterinary surgeon, but, at the request of the Editor of the *Rhodesia Agricultural Journal*, I venture to contribute a few notes gathered from my own practical experience.

The profit and possibilities of sheep are such as should appeal immediately to the new settler, because the return is so much quicker than from cattle, and the percentage of profit is at least equally high. In the first year there is the wool, and this certainly can hardly be counter-balanced by milk from the cows, for with the native stock the amount of milk given is frequently barely, and sometimes not nearly, enough for the

needs of the calf. Again, sheep are saleable at eighteen months, whilst few of the progeny of cattle can be sold under three or four years of age if full prices are to be realised.

A further advantage is that with the ewe the period of gestation is only a week more than half that of the heifer. All these advantages point to the advisability of the new settler purchasing some sheep at the outset, to say nothing of the meat thus easily and cheaply available when an unvaried diet of bully beef begins to pall and buck prove too elusive.

My own district, Iron Mine Hill, has proved admirably suited to sheep farming, with its open stretches of good grass, but there may be neighbourhoods where, at first, the mortality among the sheep is rather high. This was my initial experience on new land in Natal, until I almost gave up in despair. But, fortunately, I continued, and found that after the veld had been thoroughly well grazed by cattle, horses and sheep, the death rate declined, and has remained low ever since.

I cannot recommend any particular breed in preference to any other, but, personally, I am fully satisfied with merinos, and have had the greatest success with them. The wool from my Natal flocks has fetched top prices for two years past ( $11\frac{1}{4}$ d. per lb.), and it is with animals from the same flocks that I am at present experimenting in Rhodesia. So far, the wool has shewn no signs whatever of deterioration, and I see no reason why it should not equal the best grown down south.

I attach great importance to altitude, and my farms, in Natal and this country, are well over 4,000 ft. above sea level. Even so, I reserve the higher portions as grazing ground for the sheep when the weather is at its hottest.

An absolute necessity for all sheep farmers is a dipping tank. A brick and cement tank is simple in construction and not at all expensive, especially with the reduced railway rates on cement, and the fact that suitable material for bricks exists on practically every farm. But should this light charge prove too much for the new settler, or should his available time be too fully occupied otherwise, he may use a small iron tank, though this method of dipping is slow in the extreme.

Scab exists in Rhodesia, and very strenuous steps are imperative at the genesis of the industry to see that the provisions of the Scab Act are strictly observed. Failure in this



respect has cost the Cape and other Governments in the south enormous sums of money, running into hundreds of thousands of pounds, and if sheep-farming in Rhodesia is not to be crippled at its birth, every precaution must be taken that this disease does not obtain a firm hold. At present the greatest danger seems to come from native-owned sheep, which are allowed to move about the country with great freedom without previous inspection by anybody who can tell a scab insect from a black beetle. A considerable amount of experience is required to identify this pest, and many other parasites are frequently mistaken for it.

Owing to the recent dry season, and the provisions of the Herbage Preservation Ordinance, there was not as much grass burning last winter as formerly, and the result has been a great increase in the number of ticks, with the consequence that the sheep have suffered severely, as the ticks not only got on to the animals' feet, but also under their shoulders and on their bodies. They fastened in clusters, thus irritating the animals, and the consequent biting and scratching have had a bad effect on the fleece. The work of these ticks is frequently mistaken by inexperienced farmers for the result of scab. These ticks have given me great trouble this season. They are large brown insects, and are commonly known as "bonts." I have found that the best means of getting rid of them is frequent dipping. I dipped every fourteen days, and am glad to say that my flock is now quite free. Not only have the ticks actually on the animals at the time of dipping been destroyed, but the dip that remains in the fleece has killed their successors. The dip I use is Cooper's fluid sheep dip.

The open position of my farm and freedom from scrub has made me safe from the ravages of cheetah and jackals. Where these vermin abound it may be the practice to kraal the sheep, but this is a bad course to pursue. If it is absolutely necessary to kraal the sheep, then a large shed with an open side should be constructed and provided with a hard floor, as mud does a great deal of harm to the feet of the sheep, inducing foot-rot. Where there is any great dampness, the damage may be minimised by constructing a shallow trough through which the sheep have to walk on entering and leaving the kraal. If this be filled with dip or a mixture of sulphate of copper (bluestone), great benefit will result. My advice, however, is

to construct a paddock, enclosing about a couple of acres, which should be fenced with Pittsburg or some other vermin-proof wire.

Fencing throughout the farm is very necessary for successful sheep farming. It allows portions of the land to be reserved for grazing in the proper seasons, and ensures that all grass shall be fed off evenly.

Where there is no fencing, the planting of paspalum near the homestead will keep the sheep from straying. Sheep are great roamers, and where there is any considerable amount of bush they are difficult to find. I have carried out several experiments with paspalum in Rhodesia, and am assured of its suitability. A further advantage of artificial grasses is that they so enormously increase the number of stock a farm is able to carry—a matter that will have greater importance in the future if the present policy of cutting up farms is followed.

As regards lambing, I have found that the autumn lambs are stronger than the spring lambs, and thrive better. Late spring lambs are frequently weaklings, and lack the constitution of the autumn lambs.

I would not recommend settlers to bring up large flocks. In my opinion it would be better to import a small number and breed from them, allowing the flock of acclimatised sheep to increase naturally. It is also inadvisable to import ewes in lamb, because the long train journey from the south affects them very injuriously, and the mortality, both among dams and lambs, is very high. Sheep, also, should not be entrained after a long drive. They should be allowed to rest at least twenty-four hours. Stall-fed sheep travel better than animals straight from the veld. The latter frequently shew great nervousness, and refuse to eat on the journey. Care should be taken, also, that if turnips are provided for feed they should be cut up before being given, as otherwise the sheep will be unable to eat them.

In conclusion, I repeat that I regard sheep farming as one of the great industries of the future for Southern Rhodesia, where there are large tracts of high land eminently suitable for this industry. Though land that has been well grazed is most suitable, yet there are areas where sheep may be put down at once with safety and every assurance of success.



## Notes on Hop Growing.

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By H. GODFREY MUNDY, F.L.S., Government Agriculturist  
and Botanist.

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The Department of Agriculture has recently imported a number of hop plants of different varieties for trial under Rhodesian conditions, but a more public stimulus to experimental work with this crop has been afforded by the distribution by the South African Breweries of a number of sets to farmers throughout South Africa. Some hundreds of these have been supplied through this Department to farmers in Rhodesia, and some information regarding the crop will, therefore, probably be welcome. It may also be noted that the South African Breweries have offered a prize of £100 for the first bale of 1½ cwt. of cured hops grown in South Africa and delivered at certain specified breweries, including the Salisbury branch.

As regards a market for cured hops, the total imports into South Africa during the year 1913 amounted to 4,312 cwts., valued at £26,450. The demand, moreover, appears an increasing one, and though the crop is a costly and speculative one to grow, it is nevertheless, with good management, usually very profitable.

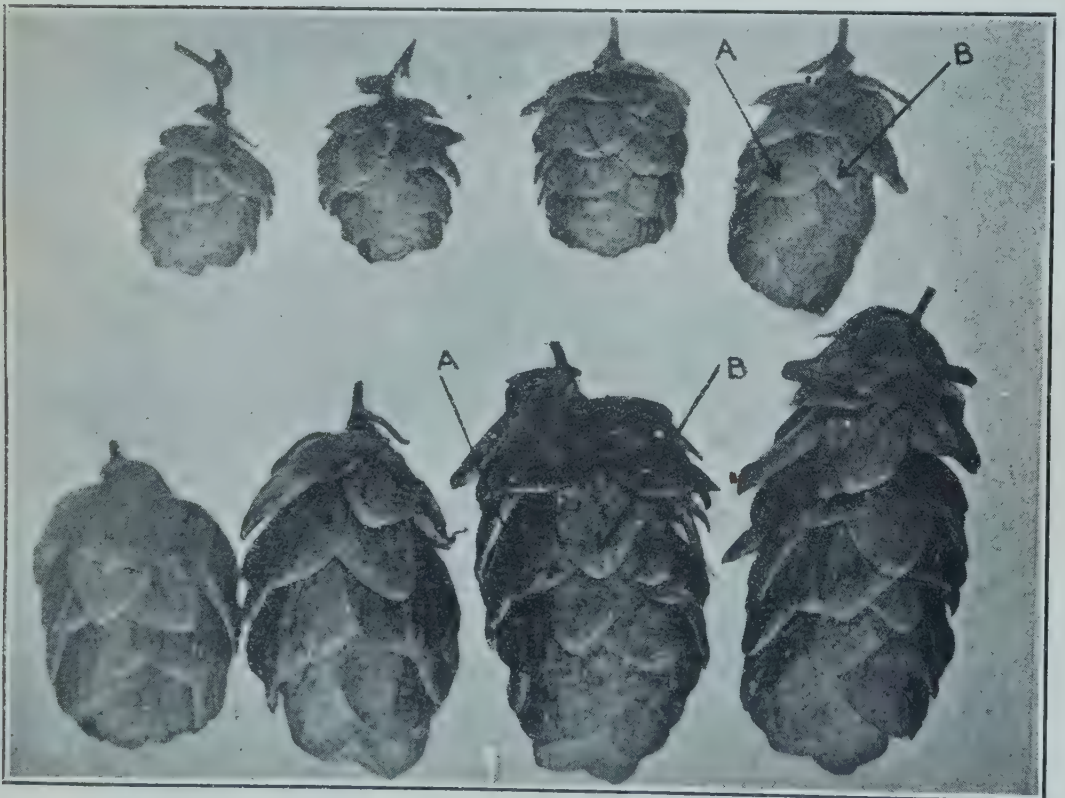
The hop belongs to the order *Cannabaceæ*, and is known botanically as *Humulus lupulus*. It is a coarse, twining, perennial plant, indigenous to England and the northern parts of Europe, but now largely cultivated in the Western States of America, New Zealand, and British Columbia.

The flowers are of two kinds, male and female, and are produced on separate plants, fertilisation being effected entirely by means of the wind, and not by insects. The male flower





A branch of mature hops.



Seedless and seeded Golding Hops (Canterbury Whitebines). The seeded hops are in the lower row. A, a bract; B, a bracteole.  
(From Journ. Inst. of Brewing.)



grows in a loose, branching axillary panicle, and consists of five oblong sepals surrounding five stamens with weak filaments. The female flowers are collected into green, scaly cones composed of bracts and bractioles (more familiarly known as petals or scales). The ordinary hop of commerce as seen in its cured state is the dried female flower. When the fruit forms, the scales grow larger, and are covered with aromatic, resinous globules called lupulin, while the ovary develops into a small nut-like object containing a single seed.

The male plant is useless to the hop grower except for the purpose of fertilising the female plants. Some growers have been of the opinion that male plants were unnecessary in a hop garden, but it has now been proved that where they are absent or insufficient in number the hops lose quality and flavour, are longer in maturing, and do not yield so heavily.

The part which the hop plays in the process of brewing is that of imparting flavour to the beer. The aroma is easily lost, either by loose packing, bad curing, or long keeping, and for brewing certain of the best quality beers new hops are essential. The quality of the product is further influenced largely by soil, climate and season. From these remarks it will be seen that the value of the crop depends largely upon the conditions under which it is grown and the skill with which it is afterwards handled.

There are several varieties in cultivation, each of which has some particular characteristic, such as hardiness, earliness or productiveness. The chief varieties are Goldings, Farnhams, Colegates, Canterbury Whitebines, Cobbs, and Fuggles; of these, the Colegates are rank and bitter, and not greatly esteemed by brewers for good quality beer.

The hop plant is deep-rooting as far as the tap root is concerned, but the feeding roots, of which there is a thick network, remain near the surface. Goldings, Farnhams, and Canterbury Whitebines are the deepest rooting varieties.

Propagation of the hop is readily effected either from seeds or "sets," but the latter is the means by which new gardens are laid down. In cases where seed is sown, probably



50 per cent. of the seedlings will be male plants, and of the female plants fully half would be worthless. Raising from seed is only resorted to, therefore, for introducing new varieties, and is only undertaken by specialists. The hop plant is a gross feeder, and the crop is therefore an exhaustive one, and is usually only grown on the most fertile soils, where, in addition, large quantities of highly nitrogenous manures, such as kraal manure or other decaying organic matter, can be applied. The most suitable soil is a strong, well-drained clay or stiff loam, which is naturally fertile, and the crop is unlikely to do its best except on soils of this nature. Alluvial deposits are particularly suitable, and it is upon such soils as these that most of the Californian gardens are situated. A reasonable supply of lime is also usually considered desirable.

Under favourable conditions the plants grow from 10 ft. to 20 ft. high, and an average crop will remove over 100 lbs. of nitrogen per acre from the soil, thus indicating the exhaustive character of the crop and the necessity of liberal manuring. Of this, about 56 per cent. is in the hops and the balance is in the leaves and vines.

In preparing a garden, the soil should be deeply ploughed and well cleaned of all weeds, and a good tilth of free working soil maintained on the surface. The "sets" or cuttings are planted in squares about 6 ft. or 7 ft. apart, two to three sets per hill. If the hills are 6 ft. apart each way there will be 1,210 hills to an acre; while, if they are 7 ft. apart, there will be 889. The "sets" may be either planted out in the hills at once or they may be planted in a nursery and then transplanted to the permanent garden when well established. Male plants should be set at the rate of about one to every 200 hills, or six hills of male plants to every acre. Usually the male plants are placed on the windward side of the garden, and should always be marked so that future "sets" may be discarded and not used indiscriminately in further plantings.

The site of the hop garden should be reasonably well sheltered from the prevailing wind, as high and bleak winds are liable to cause injury to the plants.

In primitive cultivation, one or two poles were put to each hill in order that the plants might climb up these, but

more often now one pole is put to each hill and trellised wires are carried from pole to pole, the vines being trained along the wires. A new garden is inter-cropped the first year with cabbages, potatoes or other root or garden crops.

As soon as the crop is ripe, this stage being indicated by the bur becoming solid and the scales somewhat papery-like to the touch, picking must be commenced without delay; poles may be taken down, or, if these are permanent, the vines can be pulled down from the poles. When picking is complete, the haulm should be cut away from the roots and carted to the kraal for bedding down the stock. After picking, the following operations will follow in order:—The ground should be deeply ploughed and cultivated between the rows, and then the hills should be pruned. If the plants were permitted to grow at will the roots would in a few years spread over too large an area for convenient handling. To avoid this, in spring, the soil is withdrawn from the upper roots and the *thickened basal portion of each of the last year's crop of "bines"* is cut off within about  $\frac{1}{4}$  inch of the old root. The latter, therefore, extends only a short distance each year, and the thickened pieces of root, 4 inches to 6 inches in length, thus obtained form the sets for future propagation. Hills should be left open for a day or two to dry and then recovered. Later in the season, when growth recommences, poles must be set up again and vines tied to them, three to each pole; surplus vines should be cut off. The hills should then be earthed up about 18 inches, and from this time onward horse hoes must be kept going as long as they can pass up and down the rows.

Curing is effected in the hop-house, or, in other words, a building equipped with a furnace, 14 ft. to 20 ft. above which is a slatted floor covered with coarse meshed canvas. On this floor the hops are spread to a depth of one to three feet, and kept at a temperature of about 125 deg. to 200 deg. Fahr. until sufficiently dry—a process generally requiring about twelve hours. Ventilation is provided above to allow of the escape of moisture, and for the first few hours sulphur is burned beneath to impart to the hops a nice straw-like colour and also as a preservative. One pound of sulphur is usually used for each 100 lbs. of hops. While on the drying floor the hops must be turned continually, so that all may cure equally.

In Rhodesia there should be little difficulty in temporarily adapting a tobacco barn to the purpose.

The hop plant suffers from several diseases and insect pests, notably wire-worm, hop aphis, and hop mould, caused by the fungus *Sphærotheca custagnei*, Lev. This latter disease is controlled by dusting the leaves with flowers of sulphur. The aphis is destroyed by spraying with various standard insecticides, such as whale oil soap, kerosene emulsion and soft soap and tobacco solution.

While the crop is under trial on a small scale in Rhodesia, the most simple method of growing will be on rich, well-manured soils, the vines being trained either over temporary poles, which are taken down at the time of picking, or else over wood and wire trellises. Where timber is plentiful, it will probably be simpler to use two or three poles to each hill, and thus avoid the labour of tying. If grown on a wire trellis, however, the vines must be trained and tied to the wires at intervals during the growing season. Although only a few sets have been supplied to farmers experimenting with the crop, the plants can rapidly be multiplied by the removal and propagation of further sets at the time of root pruning.



# Notes on the Raising of Seedling Trees with Special Application to Rhodesia.

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By F. B. WILLOUGHBY,  
In Charge Government Forest Nursery.

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The increasing demand in Rhodesia for ornamental and forest trees for planting on farms is a healthy sign of progress and of greater attention to the amenities of farm life. The Government Forest Nursery this season has supplied a much greater number of trees than in any previous year, but there must still be many farmers in the country, situated in localities remote from railway communication, who would give greater attention to tree planting were it not for the difficulty and expense of securing the necessary stocks. Further, for those who intend planting several thousands of trees each year it is infinitely cheaper for them to raise their own seedlings. It is for the guidance of these that the following notes on raising seedling trees have been prepared.

There are five primary objects in afforestation work on the farm:—(1) The growing of ornamental trees and shrubs to improve the appearance of the homestead and to provide shade; (2) the providing of shelter belts for the protection of live-stock, crops and orchards from cold bleak winds; (3) the production on the farm of timber suitable for rough buildings, gates, fencing, implement repairs and fuel; (4) to check soil erosion; (5) as a commercial asset for sale in years to come.

In each case the selection of suitable trees will be governed by the object in view. Amongst ornamental trees the following may be mentioned:—Jacaranda, silver oak, Indian toona, Indian sissoo, cypress pine, murray pine, one or two of the gums and Himalayan and Portuguese cypress.

For shelter belts, trees of the following kinds may be cited as examples:—Certain kinds of gums, cypress, beefwood, toona and Callitris. Generally speaking, the shelter belt tree should carry its foliage fairly low down, so as to break the force of the wind at ground level. Where timber for rough farm use is the objective, gums, toona and sissoo will be found suitable according to soil and locality.

For commercial purposes, the great desideratum is a soft, easily-worked timber of the following types:—Toona, cypress, pine or Callitris; in addition, however, as a country develops there is usually a good demand for durable hard woods suitable for railway sleepers, mining work, wagon building, and so forth. As far as can be seen, gum timber will best meet this demand, and of the gums, *Eucalyptus rostrata* is without doubt among the best.

In a country such as this, where our exotic timber trees are all still quite young, it is impossible to say which will ultimately prove the best. The most that can now be done is to indicate some of the species which can be recommended for certain purposes, and which are likely in time to grow into valuable timber.

Almost all forest trees are grown from seed. A few may be grown from cuttings or suckers, but seed usually results in a better growth. Most tree seeds germinate readily without any previous treatment, but if they are so hard that they cannot easily be bitten between the teeth, it is usually best to pour boiling water on them and let them soak for 12 to 24 hours. If exceptionally old and hard, seed may even be boiled, but only for a few minutes. The object is to soften the outer covering, and if not treated, such seeds might lie in the ground for three or four years before the outer covering would rot sufficiently to permit germination. Seed of gums, pines and many other trees retain their vitality for several years, but most leaf-shedding trees produce soft seeds which only keep for a few months, while many of them will not even keep for more than one month, and must, therefore, be sown immediately after harvesting.



When making the seed beds, a warm, sunny situation should be selected, near to the water supply, and for preference with a rich, sandy, loam soil. If there is no such soil handy, it can usually be brought from elsewhere, as very little is required. The seed bed should be dug over deeply two or three times, and care should be taken that the surface is formed of specially good soil. The beds should be carefully levelled and the seed sown broadcast, after which it should be gently pressed into the soil with a brick or piece of plank. The seed must always be covered as lightly as possible with nice, loose soil, but very small seeds, such as most gums, should not be covered at all, as, if this is done, they are unable to push their way through. No manure should be used on the seed beds.

After sowing, the beds must be covered to prevent the surface from baking and drying out too quickly. The best material for this purpose is loose grass laid on the surface fairly thickly, but not so thick that water cannot easily penetrate. In some parts of Rhodesia white ants are too troublesome to allow the use of grass, and in this case some substitute, such as "limbo," should be used. If possible, it is preferable to start with grass, as nothing else is so satisfactory, but it must be taken off as soon as the white ants appear. Most seeds will germinate within 8 to 14 days.

As soon as the young plants make their appearance, the covering must be gradually removed to prevent the seedlings becoming drawn. At this stage it is best to remove all the old grass and clean and weed the beds thoroughly; then put on a thin covering of new grass, which in a few days is also removed and replaced by "limbo" or thin grass screens. This "limbo" or grass thatch should be stretched on a light frame, so that it can easily be removed according to the weather, as it is often only required for a few hours during the heat of the day. As soon as the seedlings are strong enough, all covering should be removed to allow them to harden off.

It is usually sufficient to give the seed beds one good watering a day. If the weather is very hot, however, it may be desirable to water twice or even three times a day, especially while the plants are still very young, and if no sides have been provided to prevent the wind blowing under the thatch and



drying out the surface. Watering cans with a very fine rose should always be used, and it should be remembered that heavy watering washes away the fine top surface, and often the seeds as well. If moss is seen on the beds, it is a sure sign that too much water or shade is being given, and treatment must be varied accordingly.

The seedlings should be taken from the seed bed as soon as they have made a good, strong, fibrous root. This applies particularly to pines, which start off very quickly above the surface, but will not transplant readily until the fibrous side roots are well developed. Gums are usually pricked out when about one inch high. It is best to prick out into tins or boxes, but as it is quite impossible for the average farmer to get sufficient tins or to give them the constant daily attention and watering required, tins are not dealt with in this article. The obvious alternative is to transplant into nursery beds. These beds should be well dug over, but a soil should be selected that is not too loose, as it is required to adhere to the roots as much as possible when the seedling trees are again lifted for planting out on the land.

To prick out into nursery beds, take a small stick about six inches long and sharpened at one end. This is used for making the holes for trees and pressing the soil firmly round the roots. Be careful that the roots go straight down, and when lifting from the seed bed cut the roots to about three inches in length, as they will otherwise only curl round in the hole. Place the trees in rows about two inches apart, with about six inches between the rows. After pricking out, the nursery beds should be shaded and kept well watered for about two weeks until the trees have started to grow again. When once established, very little attention is necessary. They require no shade, and only just enough water to keep them alive. The object is to grow a strong, hardy tree, with good fibrous roots and not too many leaves, so that it will transplant easily.

The chief disadvantage of planting in beds is that there is nothing to prevent the tap root from going straight down, and a tree dependent entirely on a long tap root will not transplant readily. To check the growth of the tap root, plants grown in beds are usually "teased." That is, a long, sharp

knife is drawn along the rows of trees at an angle so as to cut the tap root about 4 inches to 6 inches below the surface. It is safer to cut from one side only at one operation. The other side can then be cut a week or a fortnight later. This should be done about every month during the rainy season, and every two or three months during the winter. This treatment forces the tree to make small, fibrous surface roots, which will be most valuable when planting out.

In planting out, a good ball of earth should be lifted with each tree. This is easiest done with an ordinary garden trowel, and if the ground is at all sticky the natives will be able to plaster the soil around the roots, so that the trees will travel a short distance quite well enough. When rather large gums are being planted, they should be cut back to about three inches in height, otherwise the tops are certain to droop, and the tree may die. It does little harm to a gum to cut it back, as it will nearly always shoot up again. Other varieties of trees, except toonass, should not usually be cut back. It is frequently fatal to cut back a pine or a cypress, as, if this is done, they seldom make a good tree.

Much depends on the weather conditions at the time selected for planting. The work should not be begun until the rains have well set in, and it is best to plant on a rainy day, as no watering is then necessary. Large trees are not, as a general rule, desirable for planting, as the percentage of losses with these will be very much greater. Six inches in height is about the ideal size.

Gums should not be sown until October or November, unless it is intended to plant them in tins, when they may be sown a month earlier. Cypress, pines, and other slow-growing trees which transplant readily may be sown in March and carried over the winter, but they will be quite large enough for planting during the rainy season if sown during August. Soft seeds that will not keep must, of course, be sown immediately they ripen.

When raising young trees, there is usually a tendency to give too much shade. To obtain strong, healthy trees the seedlings should be exposed as much as possible to the full glare of the sun, and also to the wind, so that when transplanted into the open they will be less delicate, and will, therefore, have a better opportunity to establish themselves.



## Notes on Lucerne.

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By H. GODFREY MUNDY, F.L.S.,  
Government Agriculturist and Botanist.

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With an increasing interest in dairying, and the development of numerous small irrigation schemes, the question of growing lucerne in Rhodesia is becoming of great importance. The successful cultivation of this crop depends upon a number of factors.

The most essential of these is an adequate rainfall, distributed more or less evenly throughout the year, or failing this, irrigation. Dry land lucerne has nowhere in Southern Rhodesia, as far as the writer is aware, proved a commercial success, and irrigation may, therefore, be regarded as an essential. In addition, texture of soil, depth, porosity, adequate drainage and high chemical fertility, including the presence of lime, are all factors of primary importance. Lucerne is not everywhere successful, however, even where lime is present in the soil; adjoining the best lucerne districts in the Cape Province are found large areas in which the crop cannot successfully be grown, and it is observable that as one passes northwards and grasses become more and more the dominant covering of the ground, large areas of lucerne become less and less frequent. In the United States of America also, it is in the arid Western States that, given irrigation, lucerne thrives best.

The crop revels in deep, rich, well-drained, alluvial soils, such as we possess but little of in Rhodesia. In certain of the more remote districts, however, volcanic alluvial flats are found where, under irrigation, lucerne is likely to prove very successful. Elsewhere, apart from small areas of a few acres in extent, the soil does not appear naturally well adapted to the crop, and the mere application of lime will not, in most cases,



render an otherwise unsuitable soil suitable. When, however, the other necessary conditions are present, the addition of lime will probably be very beneficial. Unfortunately, in the majority of our existing irrigation schemes, the water is being led on to comparatively ill-drained soils, or, where this is not the case, it is being fully utilised for the growing of citrus trees.

The following factors may be regarded as necessary to the successful growing of lucerne in Rhodesia:—

- (a) Irrigation.
- (b) A porous, well-drained soil.
- (c) A deep, moderately fertile soil, containing, if possible, a fair percentage of lime.

Given the above conditions, a farmer may reasonably look forward to establishing lucerne as a successful farm crop. It may be that the stand tends to die out towards the third or fourth year. This, however, should not be a deterrent, since so valuable a fodder crop is well worth growing, even though it lasts but two years, and in practice it is often found that lucerne thrives better each time it is ploughed under and re-sown on the same land.

Where lucerne is proving moderately successful, better results will usually follow the application to the land of lime and phosphatic manures, while, if root nodules are not forming, it is often well to inculcate the land with a lucerne nitrogen-bacterine culture, or with soil from a lucerne field where nodules are freely formed.

Lucerne is the most valuable fodder known to the farming world, and on every farm where well-bred stock or dairy cattle are kept, and the soil conditions warrant it, a serious effort should be made to establish the crop.

*Note.*—Since drafting the above notes the writer has had the pleasure of inspecting Mr. E. Hull's lucerne on Westacre Farm, Matopos. Mr. Hull has achieved success on what he describes as a heavy clay soil, well supplied with lime, and it must be admitted that his soil appears much stiffer and less porous than is usually considered desirable for lucerne.—H.G.M.

## Illustrations of Natural Forest in relation to Tsetse Fly.

(*GLOSSINA MORSITANS*.)

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By RUPERT W. JACK, F.E.S.,  
Government Entomologist.

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One of the first habits recorded of the Tsetse Fly (*Glossina morsitans*) by the early hunters in South Africa was its preference for certain tracts of country or patches of forest. The rigidness with which it was confined to its selected habitat awakened wonder in the minds of those who encountered the phenomenon for the first time. It was frequently stated that "fly" might occur on one bank of a small stream and not on the other, although conditions appeared to be similar, and that one might travel for miles through the forest without encountering "fly," and then be suddenly attacked in overwhelming numbers in a patch of bush differing in no way from that already traversed. These reports may be found repeated in many general works on entomology in which the Tsetse Fly happen to be mentioned. No reasons for these facts were suggested by the early observers, but they noted that "fly" was only found in forest and never in open veld.

We know now that one of the necessities of the Tsetse Fly is adequate shade. We know that it is a slow breeder, and that, therefore, a gregarious habit is of advantage to the species in obtaining the greatest increase from the fecundity of the females by enabling them to mate as early and as certainly as possible. We have reason to believe that the "fly" draws at least the greater part of its nourishment from the larger animals found in the forest, and that, therefore, other



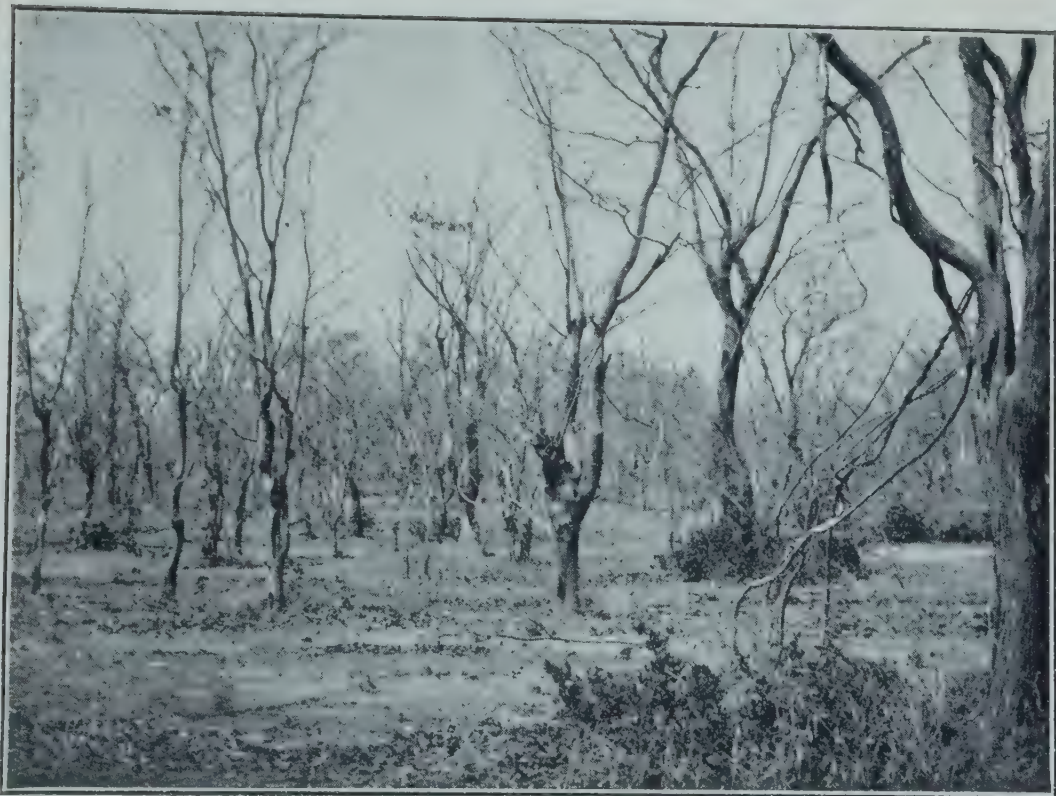


Plate I., Fig. 1.  
Mopani in October—unsuited to Tsetse at this season.

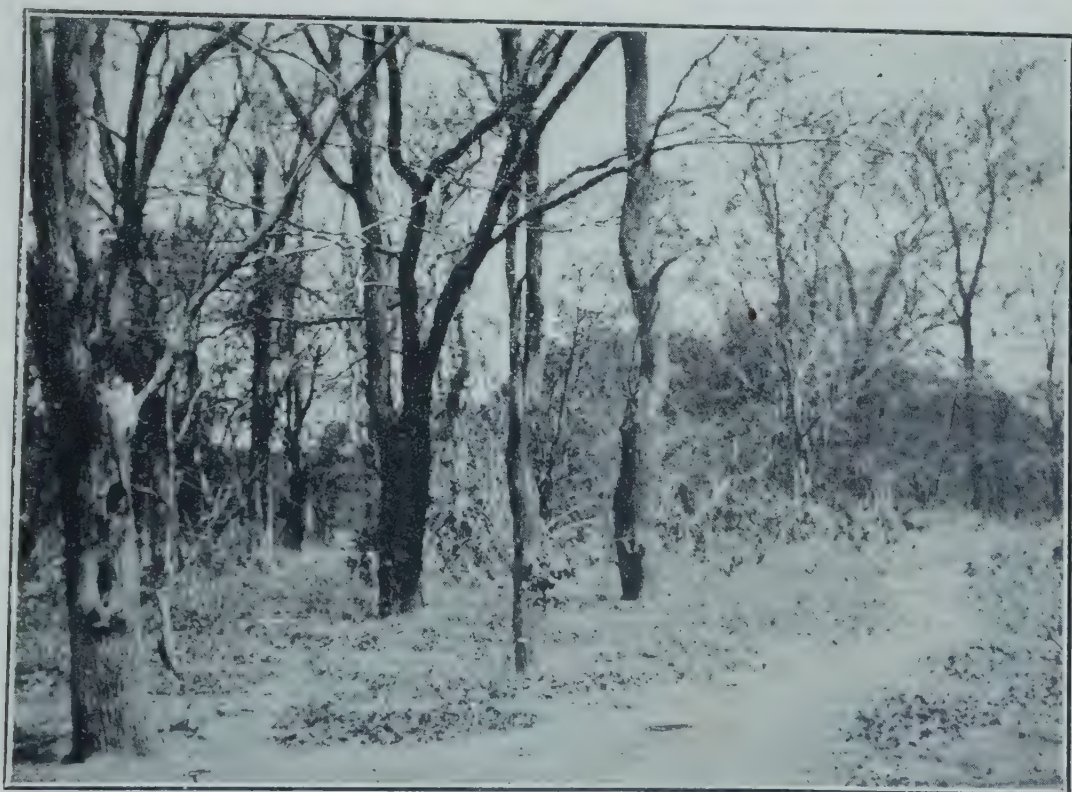


Plate I., Fig 2.  
Mopani giving way to river vegetation—approaching a danger zone.







Plate II., Fig. 1.  
Mopani in April—Tsetse present in numbers.



Plate II., Fig. 2.  
“Pan.” in Mopani (December)—Tsetse present in numbers.





conditions being favourable, it is likely to frequent parts of the country where such animals are found. We know, further, that the "fly" does not lay eggs, but produces a single, full-grown maggot at a time, that this maggot needs no food, and is only endowed with motion for a few hours, enabling it to wriggle into a sheltered situation, where it changes at once to a pupa, from which the "fly" emerges in due course. A fairly dry situation appears to be all that is necessary for the welfare of the pupa, but, as a matter of fact, the bases of large trees appear to be the favourite situations selected for the extrusion of the maggots. By means of these facts, we are now able to understand to some extent the influences that confine the "fly" to certain parts of the forest.

Before proceeding further, however, it must be understood that if the writer's experience is of any value, the impression conveyed by early reports as to the sharp delimitation of "fly belts" is an exaggerated one. In the first place, the "fly" is found in parts of the forest in the wet season where it is altogether absent in the dry, and, in the second place, the writer has never encountered "fly" suddenly in abundance unless there were well-marked changes in the forest or country to explain the fact. This is not to say that there is any particular vegetation or formation characterising a "fly belt," but that where the edge of a belt appears to be sharply defined it is in every case due to some change in the surroundings.

Now, the greater part of the surface of this Territory is covered with forest of some description. The parts of any extent that are not, as, for instance, the Insiza, and Somabula flats, the Gwebi flats, etc., may be left out of consideration, as they lack the prime necessity for the welfare of the Tsetse. The sparsely covered mimosa veld, as in the region of Bulawayo and elsewhere, is also far too deficient in shade, and has never been and never could be "fly" country, even apart from its elevation. Apart from such, we have two types of forest which cover extensive tracts of country. One of these is the well-known mopani (*Copaifera mopani*), of which great belts exist within the "fly" areas, as between the Umniati and Sengwa Rivers in the Sebungwe district, and between the escarpment and the Zambesi in the Lomagundi and Sebungwe

districts. The other is the type of forest known to the Matabele as "gusu." The term seems to indicate almost any species of not too open forest, apart from mopani, with little undergrowth except grass. The commonest trees forming gusu are Msassa (*Brachystegia randii*), the Mtondo (*Brachystegia sp.*), and the Mfuti (*B. appendicularis*). On certain parts of the sandstone, however, we find gusu consisting of a mixed variety of trees, amongst which may be mentioned the Rhodesian Teak (*Baikiwa plurijuga*). Such forest is found in the region of the Gwaai River. In other localities there is much Mobola or Grijs apple (*Parinarium mobola*), mixed with the Brachystegias, as in the forest fringing the Somabula flats. The mopani grows on a poor type of whitish soil, yielding but little grass, even in the summer. The grass, however, seems palatable to grazing animals. The soil on which the gusu type is generally found is usually more fertile, and grass may grow to a considerable height during the wet season.

These types of forest prevail in the inter-fluvial areas. In the neighbourhood of water, permanent or otherwise on the surface, a different type of vegetation is liable to occur. This consists of various ever-green trees, of which species of wild fig (*Ficus spp.*) are prominent examples. Other shady trees found in such situations include the Mobola or Mahasha (*Parinarium mobola*), the Mvumila tree (*Kirkia acuminata*), the Mashuma (*Diospyros mashuma*), and in certain parts the White Thorn (*Acacia catechu*) and other species of Acacia. This type is found on the banks of rivers or dry water courses, or in the region of vleis, and is of great importance to the welfare of the Tsetse. Between such and the mopani or gusu, belts of dense thorn brake are common. These are termed "Isi-nanga" by the Matabele. The growth is of a scrubby description.

There are, of course, other types of forest in the country, such as Mahobohobo, which is common on "formation"; but, although forming almost pure forest in places, is never of any great extent. The slopes and kloofs of mountains also bear mixed forest of special type.

During the dry season the forest trees in general lose their foliage, but many trees found along the edges of water



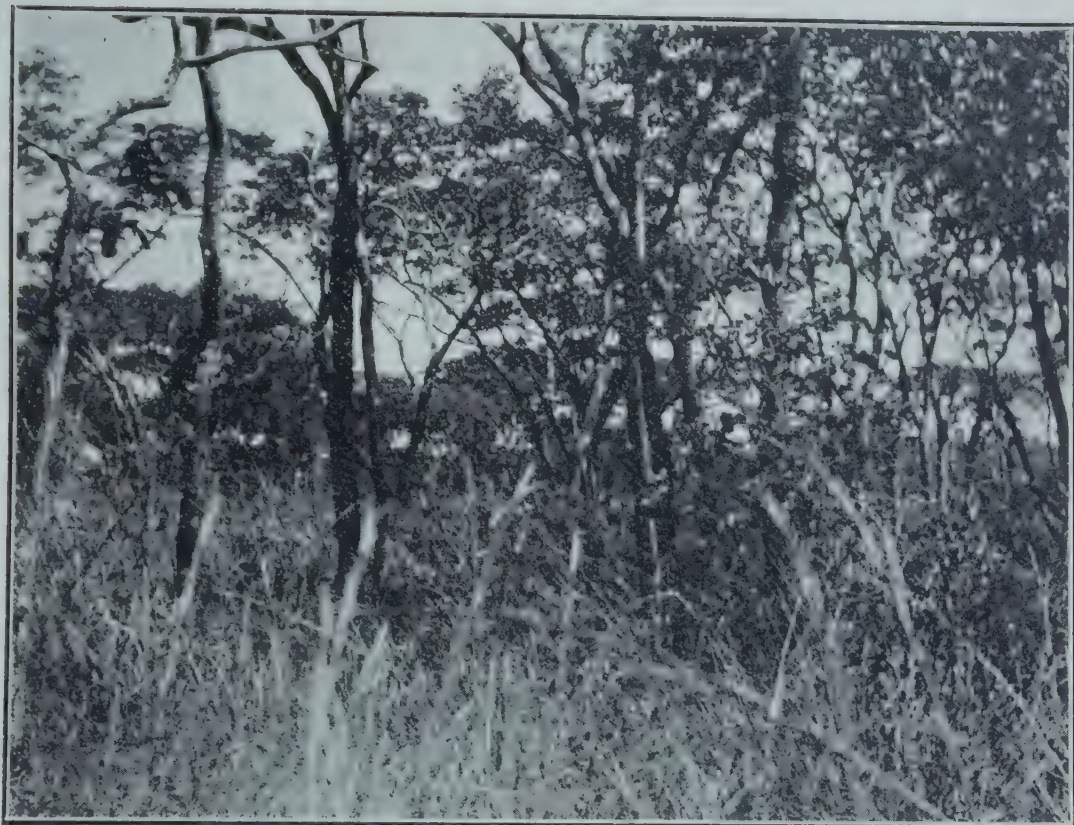


Plate III., Fig. 1.  
Msassa forest in April—Tsetse present.



Plate III., Fig. 2.  
Dense vegetation on bank of Umniati River avoided by Tsetse.







Plate IV., Fig. 1.  
Mowiri River, Hartley (August)—Tsetse present.



Plate IV., Fig. 2.  
Mowiri River, Hartley (August)—Tsetse not present.





courses and vleis, whether containing surface water or not, retain their leafy condition. The result of this is that from July to the opening of the rains the Tsetse is confined to the shade provided by the leafy trees in the situations mentioned. It is the foliage of these trees that demarcates the "fly belt" under the circumstances. When the forest comes into leaf, and in many parts of the country this is not before December, the Tsetse scatters, and far from being found especially associated with water courses and vleis, is generally more plentiful in the surrounding forest, whether gusu or mopani. Thorn brake ("isi-nanga") is not much affected by tsetse, but it rarely covers any great extent of country. Large thorn trees (*Acacia catechu*, etc.), of course, frequently form the shade near a vlei or river, and this suits Tsetse very well in the winter.

During the dry season, therefore, there are certain classes of country in which Tsetse will never be met with, and there are belts in which the pest is liable to occur. These belts may be crossed at night with less risk than during the day, or possibly a really effective Tsetse-fuge may be discovered, *i.e.*, a substance to be rubbed on animals to keep the "fly" away when traversing the belt. There is thus some practical advantage to be gained from a knowledge of the "fly's" preference in regard to types of country at different periods of the year. Even amongst professional cattle importers there seems to be a considerable amount of uncertainty on this point.

Now, a single illustration is worth several pages of written description, and in this connection the accompanying photographs taken during the writer's travels in "fly" infested tracts of country may be of service. Fig. 1 on Plate I. illustrates scrubby mopani country towards the end of the dry season. The photograph was taken in October. Note the entire absence of shade. This type of country is not suited to Tsetse once the trees have lost their leaves. The photograph at Fig. 2 on the same plate may be entitled "Nearing a Danger Zone." The mopani is about to give way to the vegetation fringing a river, the dark foliage of which may be seen ahead. This photograph was taken at the same time as the preceding, Fig. 1 representing the country just traversed, and Fig. 2 that ahead.

The difference between mopani forest in the dry and wet seasons may be seen by comparing the above with Fig. 1 on Plate II., which represents a belt of this class of forest in the Zambesi valley in April. Tsetse was quite abundant in this belt when the photograph was taken. Fig. 2 on the same plate shews a "pan" in mopani country near the Umniati River in December after good rains had fallen. The bush was full of Tsetse at that time.

The *gusu* forest is not quite so sun-baked as the *mopani* during the dry season, but nevertheless it lacks sufficient shade to suit Tsetse. An illustration of this class of bush in the leafless condition is unfortunately not available. A view shewing the trees in full leaf in April is reproduced at Plate III., Fig. 1. This was taken on the summit of a small hill where "fly" had been encountered for the first time that day. This hilltop would be quite deserted by the "fly" when the trees were leafless.

The growth of evergreen trees in the forest appears to be largely dependent on a permanent supply of abundant moisture at the roots, although this is obviously not the only necessity, as abundant moisture may be present without the trees. Rivers, water courses, vleis and pans are, however, usually bordered by shady trees all the year round. Unless the undergrowth is too dense, these form suitable shelter for Tsetse, especially in the winter. It is a prevalent opinion in this Territory that water is a great essential for the "fly," and that that is the reason the "fly" congregates near rivers in the dry season and spreads widely in the wet. As a matter of fact the "fly" shews no predilection for the banks of big rivers at any season, but during the rains it may spread thither if the forest is suitable. During the winter it tends to return to the shade of tributaries, which frequently contain no surface water. A very striking instance of this came under the writer's notice. Passing down the banks of the Umniati River in December after good rains had fallen, and the forest generally was in full leaf, Tsetse was found close up to the banks of the river itself in the mopani forest. Visiting the same spot next year before the rains, no Tsetse was seen at all in this part, and only after a search were the flies





Plate V., Fig. 1.  
Dry Pool and Vlei, Hartley (October)—Tsetse present.



Plate V., Fig. 2.  
Dopota Vlei, Sebungwe (October)—unsuited to Tsetse.





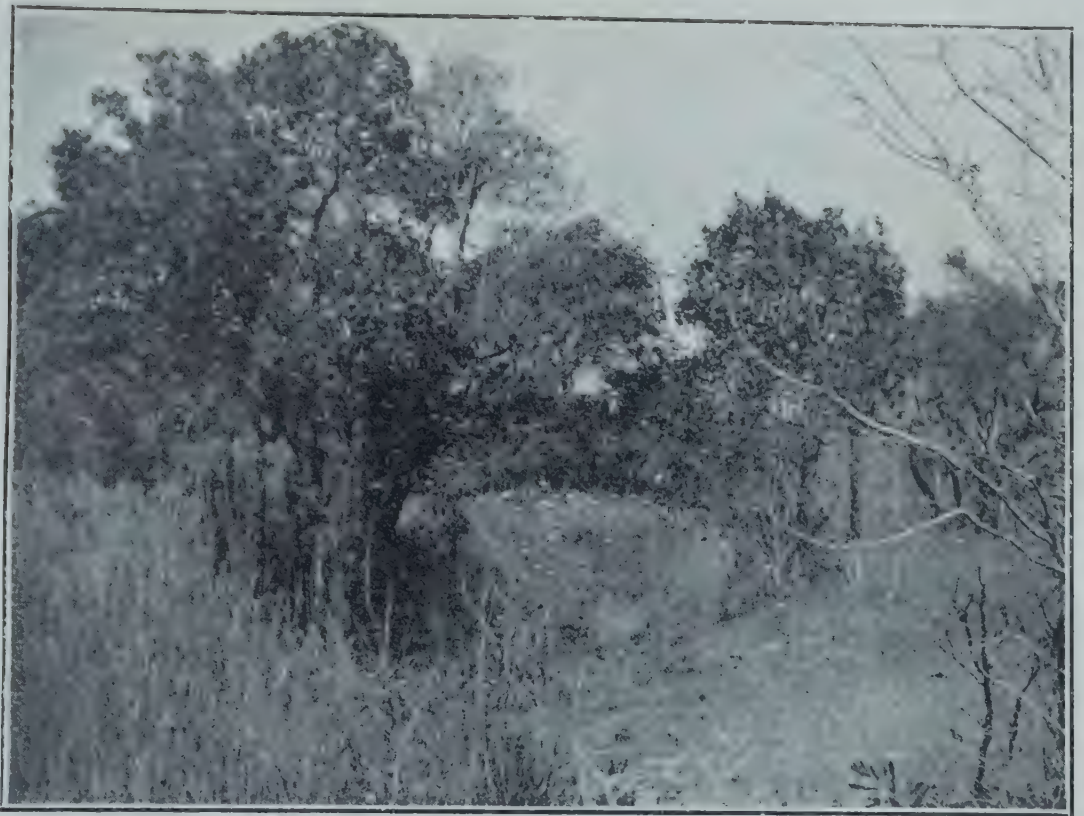


Plate VI., Fig. 1.  
Vegetation bordering Manzituba Vlei (August)—Tsetse very abundant.



Plate VI., Fig. 2.  
Shady thorn trees, Sipani Vlei, Sebungwe (October)—Tsetse abundant.



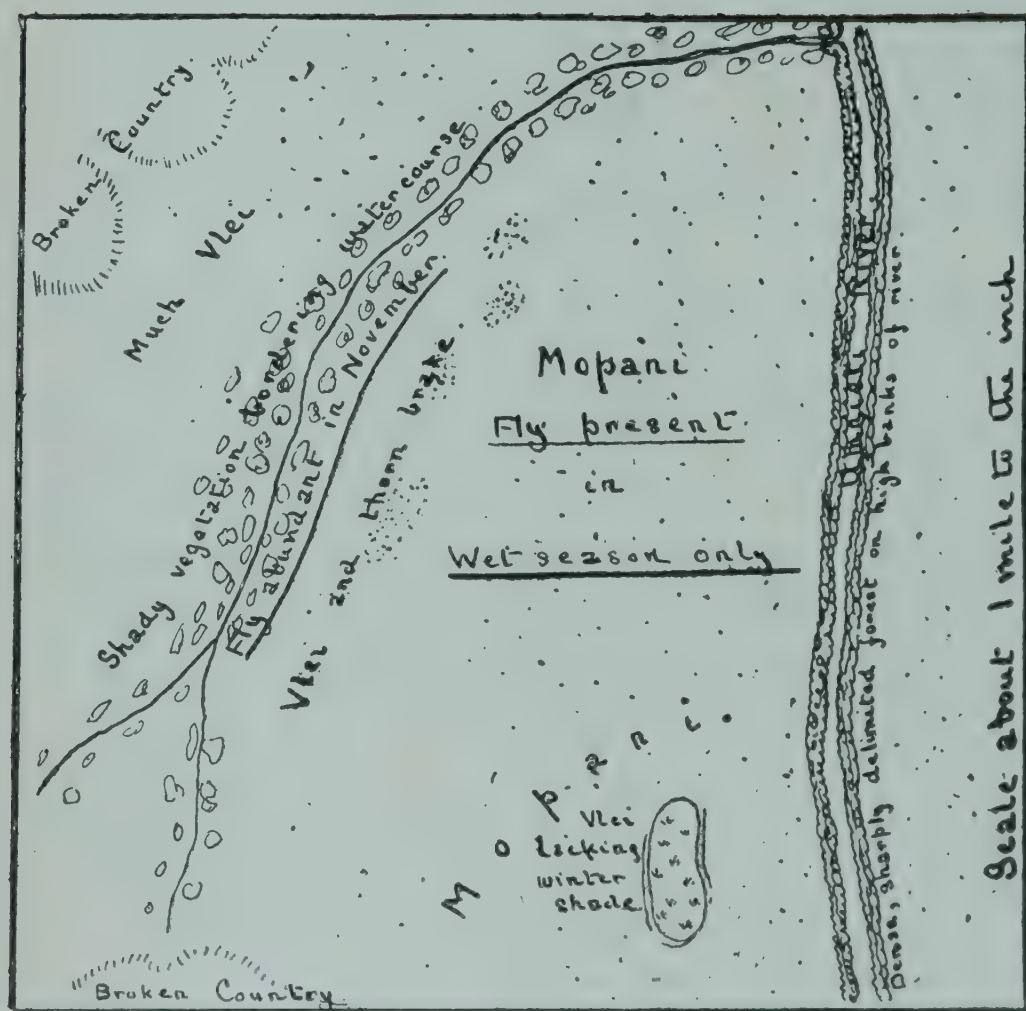


found in numbers some two miles from the river about the banks of a dry water course, tributary of the Umniati itself.

The distinction between sufficient and insufficient shade on the river banks may be seen by reference to Plate IV. Both views shew parts of the same stream not a mile apart. The stream is the Mowiri, a tributary of the Suri-Suri, and the centre of the old "fly belt" in the Hartley district. Both photographs were taken the same day in August. "Fly" was present at the pool shewn in Fig. 1 and absent from the large pool at Fig. 2. This proved to be the case at subsequent visits during the dry season, but in February "fly" was found near the second pool, when the trees shewn were in full leaf, in common with the rest of the forest.

It must not, however, be supposed that any sort of shade, if sufficient, is suitable for Tsetse. The "fly" seems to avoid too dense a thicket. For instance, on the banks of the Umniati River, shewn at Plate III., Fig. 2, "fly" proved to be absent although found in the bush not far away. The same experience was met with on the Hunyani River below the escarpment in the Lomagundi district, and it has been the writer's general experience that the "fly" does not inhabit such situations. The photograph gives a slight idea of the dense nature of the growth on the banks of this river at the part concerned.

The change in the range of Tsetse at this part is sufficiently interesting to call for closer attention. In comparative proximity to one another are to be found in the dry season (1) too dense forest for Tsetse, (2) insufficient shade, and (3) suitable shade, and the preference of the "fly" was clearly demonstrated. The following sketch explains the situation:—



Sketch map of a limited area on the Umniati River, Hartley, shewing distribution of Tsetse in the wet and dry seasons respectively.

The fact that it is not the proximity of the river in winter that is distasteful to the "fly," is demonstrated by the occurrence of "fly" on the river banks a few miles further up where the vegetation is rather more open.

Vleis are never bordered with thickets of the nature of that just described, but dense thorn brake may be present, and this is not suited to Tsetse. As a rule, however, either large shady trees with little undergrowth are present, or shade is lacking. In the first case, the vegetation suits Tsetse admirably, and many of the most populous portions of "fly" areas are comprised in such situations in winter. Plate V., Fig. 1, shews a vlei in the Suri-Suri belt in the Hartley district, taken towards the end of the dry season. "Fly" was present at the time, although not met with in the forest around. Note the shady trees bordering the vlei. Fig. 2 on the same plate shews a vlei between the Sengwa and Sasame Rivers in the Sebungwe district. This vlei is not far from a populous "fly belt," but in October, although big game abounded, no "fly" was present. A glance at the photograph will shew the small size and paucity of evergreen trees round the margin. (The shadow in the foreground is due to the fact that the exposure was made as the sun was getting low, when the numerous trunks of the leafless trees threw a shadow.)

We may conclude these illustrations with photographs at close quarters of two spots where Tsetse is extremely abundant during the dry season. Plate VI., Fig. 1, is a view of the vegetation on the borders of Manzituba vlei, west of the Sengwa, in the Sebungwe district. This is considered to be the very centre of the huge "fly" area in this district. After 1896, according to reliable report, "fly" was to be found nowhere else except in the region of this vlei, and thence it has since spread to its present limits. The photograph was taken in August, and at the time of the exposure Tsetse was present in great numbers. Such country as this is eminently suited to Tsetse, especially where game is very plentiful, as at Manzituba. Plate VI., Fig. 2, depicts a clump of thorn trees at one end of Sipani vlei, to the west of the Sengwa, in the Sebungwe district. The photograph was taken in October, and "fly" was very abundant. Sipani vlei furnishes a rather striking instance of the sharp delimitation of the "fly" during the dry season. On the western side the country is characterised by a number of big shady trees. On the eastern side



the gusu comes down to the edge of the vlei and terminates abruptly with no fringe of trees of evergreen habit. Walking down the western side, nearly a hundred Tsetse were collected in about an hour by means of our insect net. Returning by the eastern side, not a single "fly" was seen, and yet the distance from the termination of the forest on either side is not more than a few hundred yards.

To sum up, we may expect to encounter Tsetse in "fly-infested" areas in the gusu or mopani during the wet season, but not after the trees have lost their leaves in the dry. During the dry season the shady banks of streams and water courses and the shady borders of vleis constitute the danger zones. The nature of the forest determines the suitability of a tract of country to Tsetse fly, provided that a suitable food supply is present. If winter shade is lacking in the vicinity, no matter how suitable the forest may be to Tsetse during the summer months, the "fly" is unable to establish itself in that locality. The exact range to which the "fly" will spread from its winter haunts during the wet season has not been ascertained, but it is quite three miles, and may possibly be considerably more. The "fly" will, of course, follow a food supply for a considerable distance, upwards of seven miles, but apparently returns regularly to its haunts.

It is hoped that these notes and illustrations may help the reader to recognise what class of country is suited to this noxious pest and what is not, and that they may have the effect of dispelling the vague fears expressed at times that there is a possibility of the Tsetse fly sweeping over the whole country and carrying death and destruction with it. It should be realised that the portion of the Territory suited to the "fly" and inhabited by it in the early days is comparatively limited; that, apart from the suitability of the country or otherwise, the whole history of South Africa shews that the pest retreats before the advance of civilisation, and that the only parts of this Territory where the "fly" has extended of late years and threatened to re-occupy its pre-rinderpest haunts are those which have been left untouched by the hand of the European, and where nature has been allowed full sway to re-adjust conditions to the balance that obtained in former times. There is no danger of an invasion of settled parts by Tsetse.

# A Simple Method of Raising Water.

## THE WELL-SWEEP OR SHADOOF.

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By W. M. WATT, Agricultural Engineer.

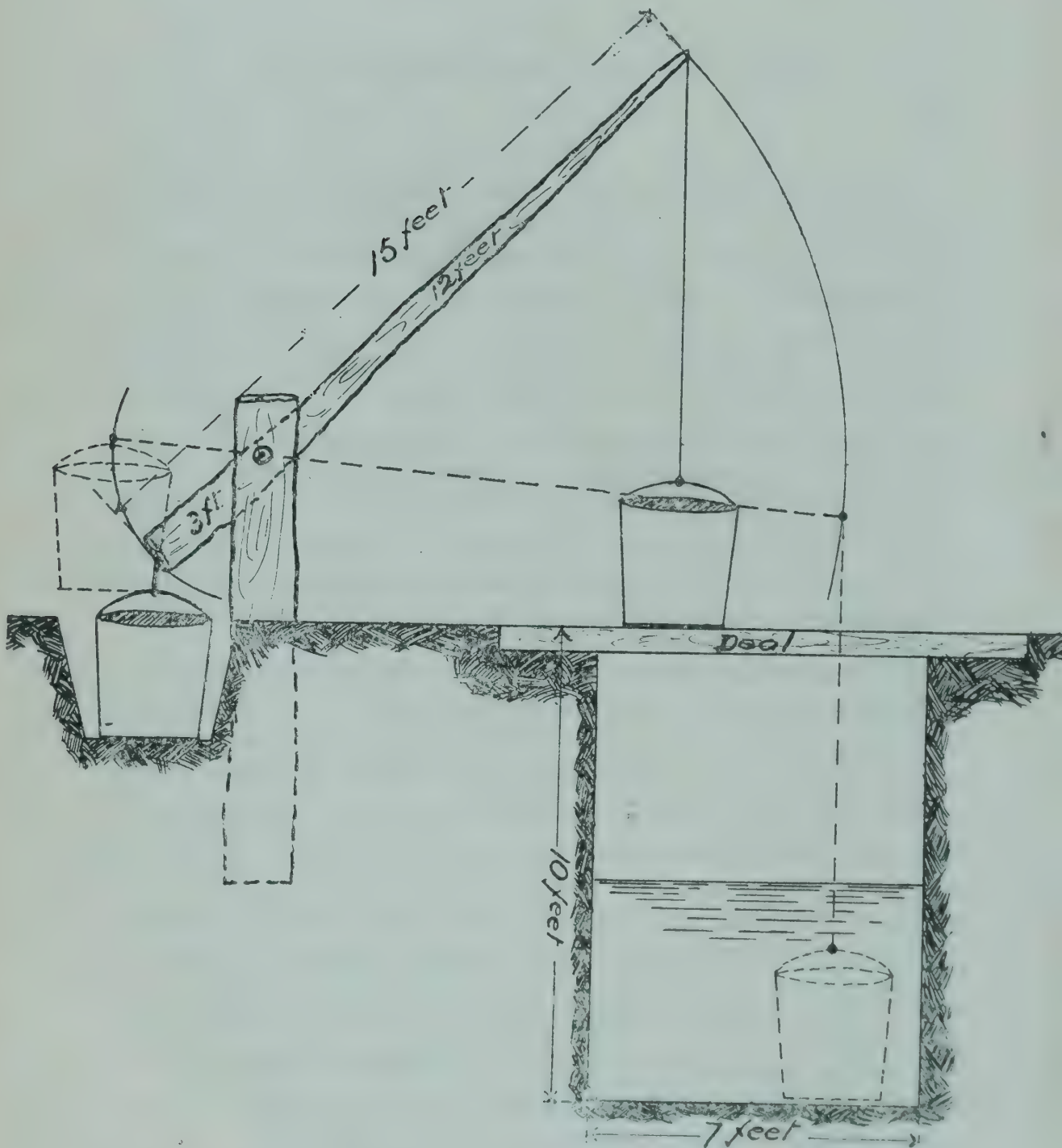
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Some slight apology for describing in a modern agricultural journal a water-raising appliance in use in various countries of the world several thousands of years before the Christian Era, is perhaps necessary. The appliance, however, although of great antiquity, has several advantages in its favour in certain circumstances. For instance, it can be utilised for raising water from shallow wells or pools, for the watering of tobacco seed beds, a small garden, etc., where the lift does not exceed about 10 feet and the quantity of water available does not justify the installation of a more modern plant. The well-sweep can be made on the farm at trifling cost, and it will be found to answer the above purposes better than where water has to be carried entirely by hand.

The principle of the appliance is simply that of the lever, although during one stage of its development it relied on the elasticity of a bamboo pole. A long beam, which might be of raw native timber, is supported on a trestle, so that it can be moved through a vertical arc, and so fixed that the arm carrying the buckets for raising the water is longer in proportion than the other arm. To the short arm a weight is attached (a bucket filled with scrap iron might be used), which should be sufficient to slightly more than counter-balance the weight of the longer arm with its rope and filled bucket. In operating the appliance, the operator pulls down the rope attached to the longer arm until the bucket is submerged and filled with water; the back balance is then allowed to perform the work of raising the water. Assuming the lever had no weight, the weight of the counter-balance required could be ascertained by remembering that the length of the long arm multiplied by the weight it carries when the bucket is full should equal the

length of the short arm multiplied by the weight of the counter-balancing materials when the lever is balanced. The best and most satisfactory method is, however, to ascertain the weight required experimentally by the trial and error system.

The accompanying sketch is self-explanatory.



*Sketch of well-sweep or shadoof.*



## Oxidation of Arsenical Dipping Fluids.

By A. G. HOLBOROW, F.I.C.,  
Assistant Government Agricultural Chemist.

It was noticed about 1910 by the Department of Agriculture, U.S.A., that there was an apparent loss of arsenic in dipping tanks, and results of investigations shewed that the "loss" was not due to actual disappearance of the arsenic from the tank, but that a portion of the arsenic had undergone a chemical change, due to the action of micro-organisms, introduced into the tank possibly with dirt and extraneous matter by the cattle. On account of this alteration in chemical composition, it was thought advisable to change the dip when a few weeks old, unless there is positive evidence that it retains its original concentration of actual sodium arsenite. The actual tick-destroying agent in arsenical dips is arsenite of soda, and the action of the bacterial life which gains entrance to the fluid is to convert or "oxidise" the arsenite of soda into arsenate of soda. This change may, under suitable conditions of temperature, approach completion when the dip is allowed to stand undisturbed, *i.e.*, all the arsenite may become converted into arsenate, but in actual practice when dips are in constant use the change is generally only partial. The importance of an enquiry into the oxidation process which proceeds in arsenical dipping fluids lies in the fact that the tick-killing power of the oxidation product (arsenate of soda) has proved to be only about a half of that of arsenite of soda, which, being interpreted, means that a dipping fluid in which all the arsenite of soda has been converted has only about a half of the tick-killing power of freshly prepared dip. It is of moment then to have some definite knowledge on this question, and to be able to say with some degree of certainty

whether in practice it is necessary to change the dip on account of oxidation only, or whether the dip remains sound until it becomes too dirty for future use. It was to settle this point that an investigation was carried out under local conditions. Selecting three dipping tanks that are in constant use and fulfilling the conditions that are normal to the average tank on a farm where the dipping of cattle is regular, samples of the dip were taken and the arsenite and arsenate contents determined. The original strength of the dip was one gallon of Cooper's dip in three hundred gallons of water in each instance.

#### TABLES OF RESULTS.

##### *Tank No. 1.*

| Date.    |      | Arsenic present as<br>arsenite ( $\text{As}_2\text{O}_3$ ). | Total arsenic<br>in terms of<br>arsenite ( $\text{As}_2\text{O}_3$ ). |
|----------|------|---|---|
| 1913.    |      |   |   |
| November | 12th | ... .080  | .087  |
| ,,       | 20th | ... .080  | .091  |
| December | 1st  | ... .078  | .088  |
| ,,       | 16th | ... .078  | .092  |
| ,,       | 29th | ... .080  | .086  |
| 1914.    |      |   |   |
| January  | 8th  | ... .076  | .083  |
| ,,       | 27th | ... .077  | .079  |

##### *Tank No. 2.*

|           |      |          |      |
|-----------|------|----------|------|
| 1913.     |      |          |      |
| September | 18th | ... .084 | .086 |
| October   | 10th | ... .067 | .084 |
| ,,        | 28th | ... .075 | .081 |
| November  | 11th | ... .077 | .081 |

##### *Tank No. 3.*

|          |      |          |      |
|----------|------|----------|------|
| 1913.    |      |          |      |
| December | 2nd  | ... .067 | .079 |
| ,,       | 16th | ... .075 | .081 |
| ,,       | 29th | ... .074 | .079 |
| 1914.    |      |          |      |
| January  | 13th | ... .067 | .071 |
| ,,       | 27th | ... .066 | .069 |

*Tank No. 1.*—During the period between 12th November, 1913, and 27th January, 1914, an average of 509 cattle passed through the tank 21 times, and the longest interval at which the dip was at rest at any time was four days; further, approximately 16 gallons of Cooper's dip (made up to 1 in 300) were added to replace that taken out by the cattle and to rectify flood water.

*Tank No. 2.*—From 17th November, 1913, to 27th January, 1914, an average of 515 cattle passed through the tank 21 times, and approximately 15 gallons of Cooper's dip were added for reasons quoted in *Tank No. 1*. The longest interval at which the dip was at rest was four days.

*Tank No. 3.*—Between 18th September, 1913, and 28th October, 1913, approximately 515 cattle passed through the tank 11 times, and 10 gallons of Cooper's dip were added for reasons mentioned in *Tank No. 1*. The longest interval the tank was at rest was four days.

It is observed from the results that the amount of oxidation of sodium arsenite to sodium arsenate is neither constant nor regular, but varies somewhat at different times, but taking the average over the whole periods, there is no cause for apprehension.

Taking *Tank No. 1* for example, starting with 9 gallons of dip in 2,700 gallons of water when the dip was freshly prepared, a further 16 gallons of dip (arsenite) were added in  $2\frac{1}{2}$  months. This alone would tend to prevent the percentage of arsenate from increasing, for arsenate is constantly being taken out and replaced with arsenite. The conclusion therefore drawn is that there is no necessity to renew a dip in which a fair number of cattle are constantly dipped at short intervals until it has become too dirty for use.



# The Preparation and Use of Concrete.

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By EDWARD HARDCASTLE.

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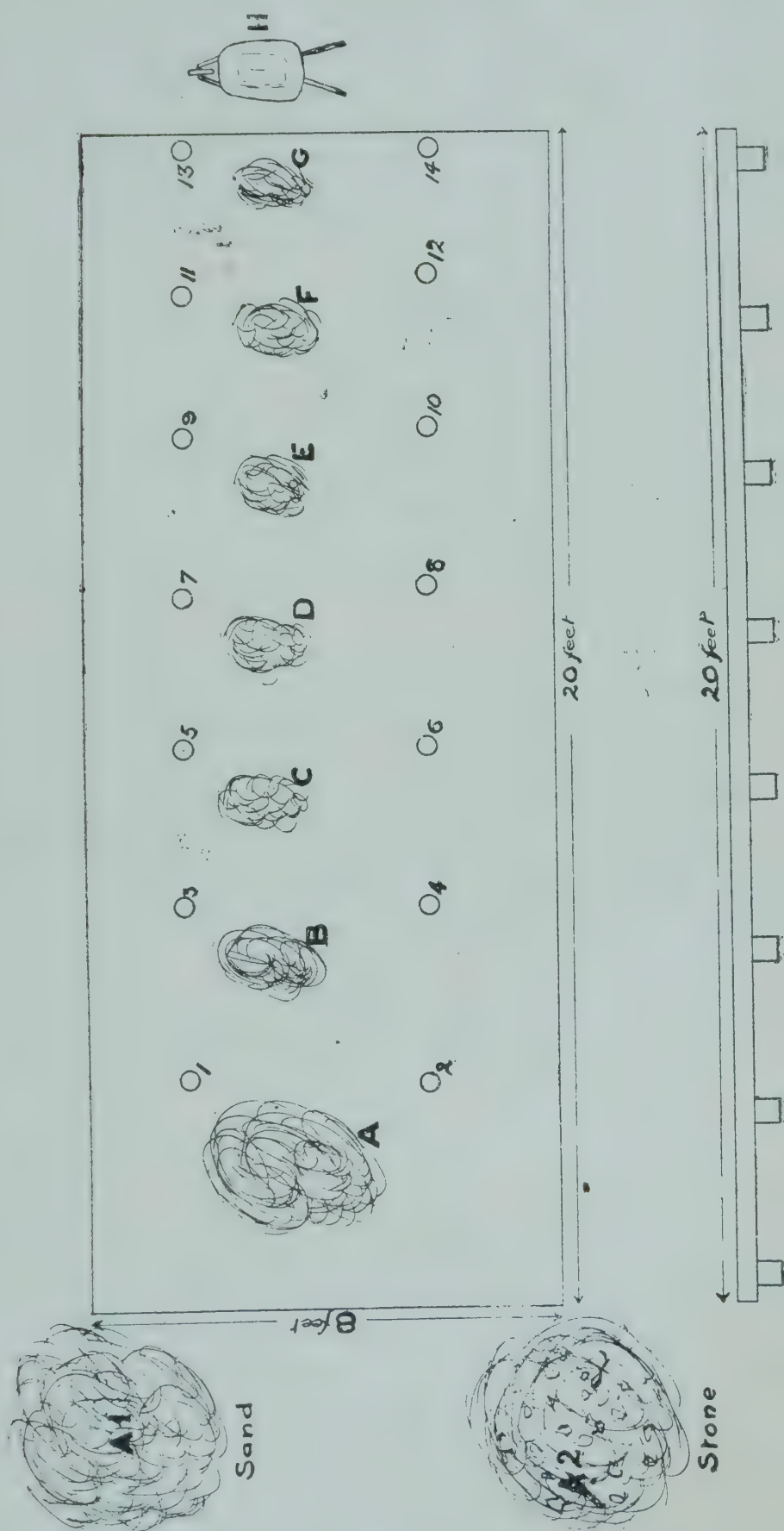
The first step is to provide a proper mixing board on which to prepare the concrete. To make one cubic yard of the mixture, the standard size of the mixing board should be 20 ft. long by 8 ft. wide, and it is best made of 1½ in. boarding, well battened with 4 in. by 3 in. deals as shewn in the accompanying diagram.

To produce good cement concrete, it is necessary that every consideration in making it up properly should be taken into account.

It is surprising that some architects and engineers in South Africa specify that the mixing is to be turned over twice in a dry state; if this was properly carried out to specification by European labour, then the materials would be all right for wetting out, but we cannot obtain such conditions with native labour, as the native does not know how to turn over the materials to incorporate them properly in two turns. When native labour is used, the proper thing to do is to turn over the materials at least four times in the dry state, or until they are thoroughly incorporated, when it is ready for wetting out.

Now it is very important that the wetting should be done with a fine-rose watering can, and gradually applied, and it should be turned over while it is being watered, and continued until the whole mass is well damped and of an even consistency and appearance. I am afraid to say well wetted, as it often leads to too much water being applied, which would certainly tend to precipitate the cement to the bottom.

The broken stone for concrete may be granite, good sandstone, well-burnt bricks, or any stone, hard, angular and clean. For general work, it should be broken so that the largest diameter will not exceed 2½ in., and it should be entirely



Mixing Board.

free from loam, clay, earth or vegetable matter, and other materials detrimental to the proper setting of concrete.

Avoid stone that has to be washed, and particularly iron-stone, as this stone, although it may be well washed, has a considerable amount of vegetable matter, iron oxide, etc., clinging to the surface, in addition to which the sides of the stone are too smooth. Aim at good, sound stone with a clean and angular surface.

The same care should be taken with the selection of sand, and if possible one should get a fine, sharp sand which should be well washed through a mosquito netting sieve to remove clayey particles or vegetable matter, etc. Washing in a running stream is better than washing in a tub or tank, but in any case use clean water, and remove the vegetable matter that floats on the surface.

The Portland cement should be of approved quality, and in the best condition.

In making concrete, there should be no voids in the work, and I have found from practice in general work that when using  $2\frac{1}{2}$  in. mechanically screened stones the proportion to use was 8 parts of stone, 5 parts of sand, and 2 parts of cement. On the other hand, when stone is broken by hand, there is often a quantity of spauls (finer stones) among the bulk; therefore, a smaller quantity of sand is required, and the proportions should be 4 of stone, 2 of sand, and 1 of cement, giving a 6 to 1 mixture.

The size of broken stones causes an increase or a decrease of the bulk of actual materials filled into position as follows:—

$1\frac{1}{4}$  in. Stone 1 cubic yard

Sand ...  $\frac{1}{2}$  ,, ,,

Cement ...  $\frac{1}{4}$  ,, ,,

—  
Total  $1\frac{3}{4}$  ,, ,,

Will produce a filling of 1.5 cubic yards.

2 in. Stone 1 cubic yard

$1\frac{1}{4}$  in. Stone  $\frac{1}{4}$  ,, ,,

Sand ...  $\frac{1}{2}$  ,, ,,

Cement ...  $\frac{1}{4}$  ,, ,,

—  
Total 2 ,, ,,

Will produce a filling of 1.7 cubic yards.



In all cases in measuring the quantity of materials taken to ascertain the amount of filling in the shuttering, the cement may be eliminated.

When hand-broken stones are used, the following proportions will produce good, strong work for general purposes:— 4 parts of  $2\frac{1}{2}$  in. stone, 2 parts of sand, and 1 part of cement, and this will fill 6.5 cubic yards in the shuttering. If these quantities be transposed as follows, a calculation can be made to obtain the different materials necessary to complete the work:—

|             | Stone. | Sand.   | Cement. | Cubic yards filled. |
|-------------|--------|---------|---------|---------------------|
| Cubic yards | 0.615  | + 0.307 | + 0.153 | = 1 cubic yard      |
| „ „         | 6.150  | + 3.07  | + 1.53  | = 10 „ „            |

By multiplying the factor of the materials by the cubic yards of filling required, it will give the amounts of raw materials necessary.

One barrel of Portland cement, when emptied out into the measure, will occupy one-sixth of a cubic yard and will weigh 400 lbs.

In making up the mixing for concrete, it will pay to make proper measures of two-thirds of a yard capacity in the following manner:—The box or measure has neither top nor bottom, and is 24 in. deep, 36 in. wide, and 36 in. broad, and is made of good floor boards, 6 in. by 1 in., well nailed to battens on the outside of the box; it should be provided with two double-handed handles, fixed across half way down, to lift away when filled.

This size of box is useful for the proportions of 6 to 1, and, being constructed of 6 in. boards, each board represents one unit of the proportion, and may be used for the stone and sand; but a separate box should be made and used for the cement, smaller in size, because cement being the expensive material, more care should be taken in the measurement. The size may be 20 in. by 20 in. by 19.4 in. deep, and represents one-sixth of the total ingredients, or, if preferred, the large box will measure all the ingredients as follows:—

|                 |                    |                |
|-----------------|--------------------|----------------|
| 1 box full,     | 4 boards in height | = 4 for stones |
| $\frac{1}{2}$ „ | 2 „ „              | = 2 for sand   |
| $\frac{1}{4}$ „ | 1 „ „              | = 1 for cement |

It would not be necessary to measure the cement, as the iron drums of cement (White's) contain one-sixth of a cubic yard when opened out, and when put in the large box would fill up to the joint of the first board. The actual measurement of the inside of the iron drum (contents) is  $17\frac{1}{2}$  in. diameter by  $22\frac{1}{2}$  in. deep, and gives 3.132 cubic feet of cement when packed, but when emptied into the measure the contents are 4.5 cubic feet, or one-sixth cubic yard. The difference is in the compression or tight packing in the drum. Sometimes cement is imported in wooden barrels, which may be damaged in transit; that is, the staves or ends may be broken, and probably quite an amount of cement lost, so that in this case the cement is measured separately.

The sand and stones should be piled at one end of the mixing board, at positions A1 and A2 in the diagram. When the measure is full of stone, it is emptied and again filled with sand. Each time the measure should lie flat on the boards when filled. The stones are then spread out in a thin layer, and the sand from the measure spread evenly upon the stones, after which the cement is taken out of the drum and spread gently and evenly over the sand. Care should be taken in windy days, otherwise considerable cement will be blown away. From this position the boys (1 and 2 in the diagram), with their square mouth shovels, should turn over the pile A to the pile B, the second set of boys (3 and 4) then turns the pile to position C, and so on. At about the position D the materials should be thoroughly mixed in the dry state; if not properly incorporated, turn over again in this position, keeping the materials in a thin layer, as it is here where it gets the first wetting. Apply the water from a can with a fine rose, and damp the materials; the boys (7 and 8) then turn it over to position E. It is again slightly wetted and turned over to F, where it will receive its final wetting and be turned over to position G. The materials should not leave here until the whole is properly damped and of uniform consistency and appearance. From this point it may be taken away in barrows, or buckets.

The concrete should never be dumped into the shuttering, but should be lifted down into its position and turned out gently, otherwise the heavy stones will separate out, and the



mass will not be uniformly mixed, and consequently will leave voids. After the concrete is turned out of the buckets, there should be another boy in the bottom of the shuttering to continuously tamp down the concrete with a fine tool until the surface presents a wet appearance; then one may expect the materials to be thoroughly incorporated.

If the materials are worked properly on the mixing board without the boys getting confused in their work, the mixing will be done continuously, and there will be no delay at any point. In cases of large works, it will be as well to have another mixing board alongside the first one, then two boys may be kept doing nothing else but putting the materials into the measures, and when that is completed, the pile A on the first board will have been removed to the position B, then the two boys can go over to the second board and work in a like manner. If the boys work and turn over the dry materials properly, the length of 20 ft. for the mixing board will be about right, but if they cannot turn it over properly, then a 24 ft. board will be preferable.

After the filling has been completed, the shuttering should not be removed under five to seven days, depending upon the moisture in the concrete. If removed earlier there is considerable risk in bringing off patches from the concrete with the removal of the shuttering. Green concrete should always be kept wet for at least seven to ten days; the shuttering will help to retain the moisture better than if the concrete was exposed, and better even than if wetted sacking alone is used.

The sun and excessive heat of Rhodesia on green cement when exposed have a deleterious effect, and it should be kept damp by a covering of wetted sacking or moist, clean sand.

Before adding new concrete to old work, it should be well wetted and cleaned. Sacking used for covering aids to keep the surface from becoming dirty.

It should be noted that very fine sand when used in cement work requires a larger proportion of cement to sand than if a coarser sand is used. In other words, the mixture should be richer in cement where fine sand is used.



# Poultry Keeping in Southern Rhodesia.

(CONTINUED.)

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By C. C. GIRDLESTONE.

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## HATCHING AND REARING.

To the novice it seems a simple matter to place a certain number of eggs under hens or in incubators, hatch a goodly percentage of them, and have a nice flock of laying birds in a few months' time. It is easy to estimate the probable profits accruing from one or more breeding pens, but unfortunately the actual results usually achieved fall far short of the forecast. Consequently the ardour of many a beginner is so damped in the early stages of his experience that his efforts stop there, and he becomes one of the many who assert that Rhodesia is unsuited to poultry. Inexperience and lack of knowledge explain nearly every failure.

Fowls purchased at adult age will afford some measure of success and profit, even with inexpert treatment, but to breed sound stock, hatch every fertile egg, and rear to healthy maturity a profitable percentage of the chicks, demands unceasing attention, an aptitude for the work, and a knowledge of its requirements.

By sub-division under distinctive headings, an effort has been made to concisely review the subject in the order of natural sequence. The advice given and the methods advocated are the result of comparative experiments carried out under local conditions far less favourable than those ruling on most Rhodesian farms or plots.

*Methods of Hatching.*—There is much to be said in favour of both natural and artificial modes of hatching. Farmers

desirous of substantially augmenting their source of revenue by marketing the product in bulk must needs hatch annually a larger number of chicks than others who primarily desire eggs and poultry for their own consumption, with occasional disposal of surplus. In the former case artificial incubation, incurring the purchase of one or more incubators of reliable make, may be preferable.

*Hatching by Incubator.*—There are at least two standard makes of incubators on the Rhodesian market, namely, the Hearson and Tamlin, both excellent though costly machines. Full directions for use are supplied by the manufacturers, and these, as far as they go, are sound, but by applying them too rigidly indifferent results may occur. The incubator has yet to be constructed which can be handled in strict accordance with its accompanying printed instructions irrespective of climate, season, and locality. To obtain profitable results from the best of them, suitable quarters are essential, and every detail of their construction and working must be thoroughly mastered before use. They must also be tested in running order for at least 24 hours before the eggs are placed in the tray, so that the principle and knack of maintaining an even temperature may be fully grasped before there is risk of loss.

A cellar is usually recommended as the best situation for an incubator, but buildings in Rhodesia being mostly of a superficial character, we must content ourselves with something less ideal. In some town and farm dwellings there is at least one room protected to some extent from the direct rays of the sun, and in which the day and night temperature remains moderately even. In such a room, with intelligent and careful handling, excellent results can be obtained. On the other hand, many farm buildings are lacking in natural or structural shelter, and suffer so great a fluctuation of temperature within as to be utterly unsuited to the purpose.

Failing suitable accommodation in existing buildings, a well-constructed pole-and-dagga hut can be used, and will be found to give better results than the majority of one storeyed and iron-roofed brick buildings. The best type of hut is one not less than 12 feet in diameter, solidly made of stout poles, substantially daggaed; thatch as thick as possible and water-

proof; ventilated, but window preferably situated at a point distant from the door about one-third of the circumference of the hut, to avoid any direct draught upon the incubator. The eaves of the thatch should project well over the sides of the hut, sheltering them from the sun as much as possible. The floor must be carefully levelled and beaten firm.

Poor results are usually due to an insufficient supply of moisture during incubation. Except in the wet season during continuous rains, when both soil and atmosphere are largely impregnated with moisture, the appliance provided for the purpose must be frequently supplied with tepid water. Without such attention the egg content will dry out to an abnormal degree, causing the chicks to either succumb prior to hatching, or if hatched, to be undersized and deficient in vitality.

When the eggs have been in the incubator seven days, they should be tested, and any not shewing a live embryo withdrawn. If this is not done, and infertile eggs allowed to remain intermingled with those containing live embryos, there will be inequalities of temperature in the drawer, particularly after each daily cooling of the eggs, and this, however slight, must adversely affect the ultimate result. Decomposition will also take place, and the resultant odour and possibility of burst or breakage is obviously detrimental. Apart from the danger of injury to the fertile eggs, infertiles, if promptly removed, may be used in the household or retained to form part of the first rations of the forthcoming hatch.

Testing should be undertaken at the usual time of cooling and turning, and is facilitated if the room can be darkened. The requisite accessories comprise a medium sized table, lamp, testing tube, and receptacles for the tested eggs. An acetylene bicycle lamp or small reading lamp with metal reflector answers the purpose admirably, and a testing tube may be made by rolling sheets of thick paper, gumming the internal and external ends securely, and so forming a tube about eight inches long with a diameter not quite large enough to contain an egg of average size placed lengthways. The table must be cleared and the egg drawer removed from the incubator and placed thereon, with the testing lamp on the left or in front of the drawer, and on the right a shallow box, contain-



ing bran or other soft substance to prevent jarring, in which the eggs as tested can be placed. Another receptacle is required for the infertile eggs as rejected.

Each egg must be removed without shaking or jarring, and held tightly against one end of the tube, and the contents carefully examined by holding it a few inches away from and in front of the lamp. In fertile eggs the live embryo has the appearance of a network of veins, and a movement or pulsation can be easily detected. Infertiles are perfectly clear, and those containing dead germs will shew either a dark spot close to the shell, a darkish streak, or an encircling dark line. After a few hatchings, there is no difficulty in distinguishing the fertile eggs, but many people test again about the fourteenth day, and at the first testing do not remove any eggs of which there is the slightest doubt, and this is perhaps the safest plan. A second testing is always advantageous, as from various causes embryos may succumb throughout the hatching period.

On the evening of the nineteenth day the final turning and cooling takes place. The moisture tray should then be well supplied, and the drawer kept closed until hatching is well on the way towards completion. It is particularly necessary at this stage to maintain an even temperature, and if the operator is impelled by anxiety or idle curiosity to frequently open the drawer to watch the process of hatching, a poor hatch may with certainty be expected.

Under normal conditions, on the morning of the twenty-first day, some chicks will be hatched and ready for removal, after which, at intervals of about four hours, the drawer may be momentarily opened and all completely hatched chicks removed to the drying chamber.

There is no need for undue anxiety when it is found that many of the chicks are out before some of the eggs are chipped, as such irregularities can be accounted for by several natural causes. Some of the eggs may have been fresher than others, some thicker shelled, and so on.

It is a common assertion that artificially incubated chicks are less thrifty than those hatched in the natural manner. That this frequently is the case there is no doubt, and the

causes soon become apparent to those who hatch and rear a number of birds by both methods. There is little or no difference in size or stamina between incubator-hatched and hen-hatched chicks when ideal conditions and methods of treatment prevail; but whereas perfection in the handling of an incubator can only be acquired by much experience and unfailing attention to detail, hatching by hen is comparatively simple, and its essentials can readily be mastered by even a child possessed of average intelligence.

*Hatching by Hen.*—Assuming the eggs to be sound and fertile, good results can be assured if a few simple but necessary precautions are taken. Some few days before they are placed on the eggs, the hens should be taken in hand, and well dusted with insect powder two or three times daily until they are absolutely free from fleas, lice, and other parasites. During this preliminary preparation they should be allowed to sit on china eggs, and fed on whole mealies to maintain their broodiness. A separate box is required for each hen, not less than 18 inches square, with no bottom, and the front hinged or detachable, and well ventilated. These boxes must be placed on the ground in a disused hut, a cool shed, or in any position sheltered from rains and excessive variations in temperature, but always well away from other live stock. In preparing the nest, the ground should be scooped out in saucer shape, half a bucket of water, to which a small quantity of dip has been added, allowed to soak well into the depression so made, and soft hay then shaped to form a nest of natural appearance. The eggs, 10 to 15 in number, according to size and type of hen used, can then be placed in the nest in circular formation, and at dusk the hen quietly placed on them, firmly securing the front of the box as soon as she has settled down. After the second day, once or twice daily take the hen off the nest for 15 to 20 minutes, giving her a handful of whole mealies, fresh water, and an opportunity to indulge in a dust bath. After the nineteenth day, she must not be removed from the nest, but left without any disturbance until the hatch is complete. If whole mealies only are fed, and the daily routine carefully attended to, a healthy chick from every egg fit to hatch may confidently be expected. The customary method after hatching is to allow the brood to run with the hen.



sometimes in netted enclosures, but more often with unrestricted freedom. In either case the disadvantages of hen hatching as compared with incubator hatching soon become apparent. The chicks become infested with fleas and lice, many are killed by hawks and other marauders, and the less vigorous chicks are frequently lost in long grass or succumb from exhaustion. A combination of natural and artificial treatment is therefore recommended, with the object of utilising the recognised efficiency of hatching by hen, but avoiding the subsequent casualties from the various causes mentioned.

*General Care and Feeding.*—The chicks, as soon after hatching as possible, should be removed to small boxes, about 18 inches in length and width and 9 inches deep, with a small aperture in the depth to allow of easy entry and exit, these boxes being placed in small coops made ready for the purpose, with a plentiful supply of sand and short hay or litter underfoot. The number of chicks per box should not exceed 25, and a moveable run constructed of fine wire netting on a wooden framework must be attached to each coop. Boxes, coops, and runs must be removed to fresh ground as the old site becomes fouled. Clean, fresh water should be supplied from the start, preferably in glass or earthenware vessels, so placed as to prevent spilling or fouling, and well shaded from the sun. Give the first feed 24 hours after hatching—not sooner. It may consist of finely chopped, hard-boiled eggs and coarse oatmeal, or the latter only. Hard-boiled eggs are not particularly recommended, but it is often found economical to feed the infertile eggs discarded during hatching in this manner. For the first week coarse oatmeal is the best food, occasionally mixed with fresh milk, and for variety a little rice pudding made with milk. After the first week, and until three months of age, feed the following grains, or as many of them as can be obtained, but on no account reducing the proportion of oats. They may be mixed or fed separately in rotation, adhering to the proportions given as closely as possible:—Oats, 4 parts; wheat or buckwheat, 3 parts; maize, 2 parts; munga, 2 parts; hemp or sunflower,  $\frac{1}{2}$  part. With the exception of munga, the grain must be passed through a mill (failing anything better, a cheap coffee mill may be obtained, which will serve the purpose), and ground at first to about the gauge of coarse oat-



meal, gradually increasing in coarseness week by week until at three months all the grains mentioned, excepting maize, are fed whole. Oats are indispensable to the ration, and must be of the fat New Zealand type, the cheaper colonial varieties being principally husk. This form of chick feed may at first appear expensive, but none of the cheaper grains can be fed exclusively to give good results, and although preparation of the grain entails some trouble, it will be found infinitely cheaper and more beneficial than feeding imported, prepared mixtures.

Abundance of green food and grit must be regularly supplied, a small quantity of the latter being added to each feed. Meat, though not essential, tends to stimulate growth and vigour, but must be well cooked and minced. Crushed bone or bone meal will improve stamina and aid assimilation of other foods. When surplus milk is available, it may be utilised to great advantage. Mealie meal well cooked in milk and then brought to a crumbly consistency by the addition of bran, can be fed once or twice a day, and will improve growth and condition. It is only to young growing stock that maize and its products can be fed to any extent without harm. For such it is recommended, provided always that plenty of green food accompanies its use. Always regulate the diet to avoid either constipation or purging. Normal conditions of health are best maintained without the use of medicines. Carefully watch young stock throughout all its stages for the first signs of insects or sickness, and take prompt action to arrest the spread of either.

With a view to demonstrating in concrete form the relative merits of rearing chickens by hen and on the cold brooder system, experiments on a simple and inexpensive scale were made by the writer during the past twelve months, the results of which are interesting, inasmuch as they go far to prove that with system and care there need be the smallest percentage of losses, if any, after hatching, provided the cold brooder system recommended is adopted. The following is an outline of two of these experiments:—

*Experiment No. 1.*—Three hens, free from insects, were placed at the same time on 36 eggs equally divided between

them, from which were hatched 30 healthy chicks. The hens with their broods, after a month's confinement in small runs, were allowed the free range of four acres of ground, part cultivated and part grass. Within a week from hatching, many of the chicks were found to be badly infested with fleas and body lice, necessitating frequent application of powder and prepared grease. In spite of every precaution and remedy, it was impossible to entirely suppress these pests, and the chicks made poor growth, several deaths occurring from debility. During the second month roup made its appearance, and although a number of cases were successfully treated, some could not be cured. At the end of the third month the tally of chicks was 18—of the remainder, 3 having died from debility, 6 from roup, and 2 unaccounted for. In the foregoing experiment, an endeavour was made to follow the most general method of rearing hen-hatched chicks, and the indifferent result demonstrated the necessity of three essential conditions of success, namely:—(1) Absolute freedom from insects; (2) prevention of contagious disease, particularly roup; (3) avoidance of unaccountable losses. A method was then adopted to meet these conditions, with what measure of success the result indicates.

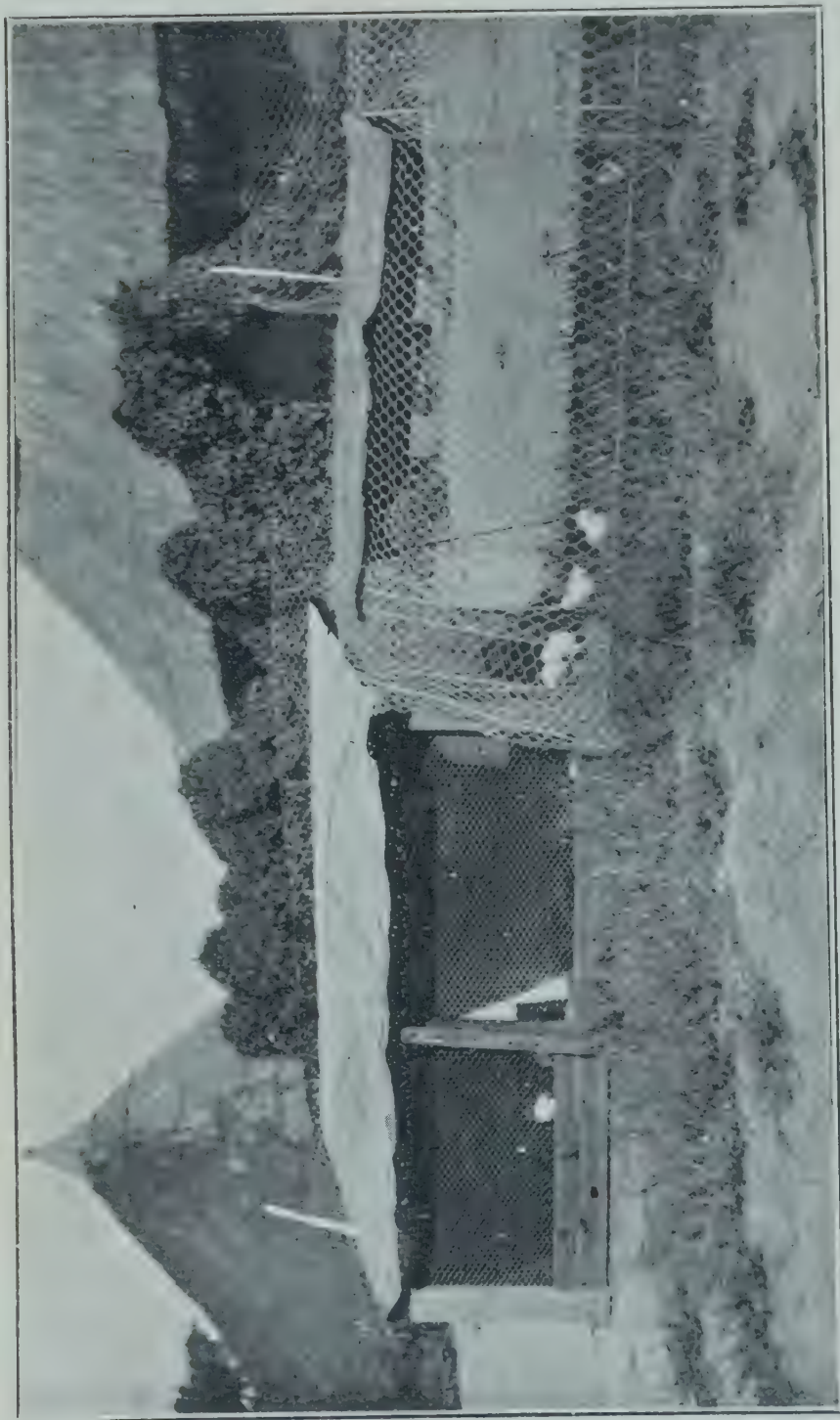
*Experiment No. 2.*—Four hens being broody, they were placed on twelve eggs each, under similar conditions to the first experiment—38 healthy chicks resulting. These were removed a few at a time, as hatched, carefully dusted with insect powder, and placed temporarily in two small boxes containing fine sand and short litter. These were placed on a warm, sheltered stoep, covered with fine netting during daytime, and over that sacking at night. On the second day they were removed to two chick coops, an equal number in each, with attached runs 10 feet by 3 feet. It was found necessary for the first two or three days to place many of the chicks in their sleeping boxes by hand, after which their natural intelligence was sufficient guidance. Segregation being the principal objective, in order to avoid disease or insect infection, the coops and attached runs were placed well away from other live stock, and were situated in a paddock of *paspalum* grass. Coops and runs were removed to adjacent fresh ground once or twice a week, as appeared necessary. After six weeks, the

coops were occasionally opened in the late afternoon, and the chicks allowed out, but as two were lost by so doing, it was discontinued, and in lieu thereof supplementary runs were netted off, each 24 feet by 15 feet, so affording increased exercise and amusement in proportion to the growth of the chicks. Throughout this method of treatment, the chicks enjoyed complete immunity from insects and sickness of any sort; there were no losses beyond the two referred to, and at three months of age the remaining 36 chicks were in the best of health and condition.

Although of sturdy and compact frame, their growth was remarkably slow. This, however, in the writer's opinion, is no disadvantage, as the ultimate value of slow-maturing stock is greater than when growth has been unduly rapid or forced, and eggs from such stock will undoubtedly be larger than those from more precocious birds.

The accompanying illustration is from a photograph taken at Mr. Sheppard's poultry farm, Waterfall, near Salisbury, and represents the type of cold brooder and attached run recommended in this article.





Cold brooder and attached run.



# The Umtali Co-operative Dairies.

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## RULES AND REGULATIONS.

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We publish, for the guidance of farmers who may wish to form a similar society, the rules and regulations of the Umtali Co-operative Dairies. With regard to the latter, it has been suggested that a further rule should be added, to the effect that as regards produce, such as cream, members should be required to send it all to the Society until sums owing have been paid.

### NAME AND OFFICE.

1. Name:—The Umtali Co-operative Dairies.
2. Office:—Umtali.

### OBJECTS.

3. (a) To purchase dairy stock for members.
- (b) To assist members to dispose of their dairy produce.
- (c) To establish, if required, a butter factory.
- (d) To generally promote the interests of the Society in selling and buying.

### TIME OF ESTABLISHMENT.

4. The Society shall be established for a period of ten years, which period may be extended from time to time.

### CAPITAL.

5. Capital shall be raised by means of loans or overdraft from the Society's bankers on security of the members, jointly and severally.

The Directors shall have power to raise initial capital up to and not exceeding £10,000 for the purchase of dairy stock.



### FINANCIAL YEAR.

6. The financial year of the Society shall be reckoned from the 1st day of June to the 31st day of May in each year.

### MEMBERSHIP.

7. Owners and occupiers of land of European descent are eligible for membership, applications for membership to be made in writing to the Directors, who shall have the right to accept or refuse such application.

8. Every member at the time of joining shall sign his name in the members' book and, by his signature, bind himself to the existing regulations or alterations of regulations which may be lawfully made from time to time without any notice from the Society being required.

9. The widow of a deceased member may, subject to the approval of the Directors, become a member in place of the deceased, and take over his rights and obligations, or the heirs shall be entitled to receive                      per cent of the deceased's interest in the Society, the balance to be added to the Reserve Fund.

### RESIGNATIONS.

10. A member may resign at the end of a financial year, provided that he has given to the Secretary three months' prior notice in writing, and provided that his obligations to the Society have been fully discharged.

11. A member may be expelled from the Society by a majority of two-thirds of members present and voting at a special general meeting called for the purpose.

12. Resigned or expelled members have no claim on any Reserve Fund created by the Society.

### DIRECTORS.

13. The Board of Directors shall consist of seven members to be elected for a period of twelve months, and such district members as it may become necessary from time to time to appoint, three to form a quorum. At each annual general meeting three Directors shall retire. Such retiring Directors shall be eligible for re-election. Any vacancies shall be filled by the remaining Directors until a general meeting can be called for the purpose.

14. The Directors shall act in the name of the Society, and they shall exercise, within the limits of these regulations, the same power as if they had been determined by a general meeting. The Directors shall account and report for all their transactions at each general meeting and special general meeting when called upon to do so.

15. The Directors shall meet as often as necessary, and their positions shall be honorary, but travelling and out-of-pocket expenses shall be refunded when travelling on the business of the Society.

16. Any member of the Society shall have the right to attend any meeting of the Directors in order to bring forward any special matter or grievance.

17. The Directors shall engage a sufficient staff to carry on the work of the Society, fix their salaries, and determine the work to be carried out by the employees; they have also the right of suspension or dismissal. The cost of management to be a *pro rata* charge against the members.

18. The Directors shall see that proper books are used and kept up to date, and also look after the property of the Society.

19. The Directors shall open a banking account, into which all moneys received shall be deposited as soon as possible after receipt. All cheques must be signed by the Chairman, or two Directors in his absence, and countersigned by the Secretary.

#### GENERAL MEETING.

20. The annual general meeting of the members shall be held within six weeks after the close of the Society's financial year.

21. All questions submitted to a meeting shall be decided by a majority of votes, except where otherwise provided by these regulations. Voting by duly authorised proxies shall be allowed.

22. No alterations of the present regulations shall be made except at a meeting specially called for the purpose, at which at least two-thirds of the members registered on the books of the Society shall be present.

23. In no case shall an interval exceeding six months occur between general meetings. All meetings shall be convened by notice posted to members at their addresses fourteen days at least before the day appointed for the meeting.

#### SPECIAL GENERAL MEETING.

24. A special general meeting must be called at any time, upon a requisition being sent to the Directors, signed by at least ten members of the Society, such requisition to state clearly the reason or reasons for calling such a meeting.

#### REGULATIONS REGARDING SUPPLY OF LIVE STOCK.

25. No members shall incur a greater liability than £150 in any one year, and no member shall incur a greater liability than £300 in all, at any time.

26. All dairy stock supplied by the Society to its members shall remain the property of the Society until the amount due on the stock shall have been paid in full. Any member receiving such dairy stock from the Society shall not be permitted to part with the possession of such stock or its progeny, except by special permission granted in writing of the Directors of the Society, until such time as the original stock has been fully paid for.

27. Until the dairy stock shall have been paid for, members shall report at least once in every six months to the Directors:—

(a) The health and condition of stock.

(b) Increase.

(c) Decrease, and the cause.

28. Any deaths of the original stock are to be reported within one week of their occurrence.

Notwithstanding the foregoing, any loss of stock shall be held to be the loss of the member and not of the Society.

29. The Board of Directors shall have the right in person, or by duly authorised agent, at all reasonable times, to enter upon the premises of any member and inspect the stock supplied by the Society until such times as the stock are fully paid for.



30. All dairy stock obtained through the financial aid of the Society must be purchased by or through the agents appointed by the Directors.

31. Every application for stock must be in writing and must be accompanied by a deposit equivalent to £1 for each head of stock applied for; the amount of such deposit shall be held by the Society until the completion of the final payment of stock supplied.

32. Purchasers of stock shall give their promissory note to the Society for the purchase price and interest.

33. The Directors may, in default of payment of interest on capital, apply the deposit of any defaulting member towards payment of same.

34. Notwithstanding the provision contained in rule 33,

- (a) the Directors shall have the right in default of payment of interest on capital, to re-take the delivery of the cattle in the possession of a defaulter, who shall forfeit any benefits he may be entitled to as a member of the Society;
- (b) if a member fails to fulfil his engagements towards the Society, he shall be responsible for any loss or damage the Society may sustain through his action.

#### ARBITRATION.

35. Should any dispute arise with regard to the regulations of the Society which cannot be amicably adjusted, a special general meeting will be called and three members elected as arbitrators; the decision of the arbitrators is final and cannot be appealed against.

#### LIABILITY.

36. All members of the Society shall be jointly and severally liable for the obligations of the Society.

#### DISSOLUTION OF THE SOCIETY.

37. The Society may be dissolved by a resolution of a special general meeting called for the purpose, passed by two-thirds of the members of the Society.

## The Tobacco Industry.

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With the introduction of the re-ordering machine at the Tobacco Warehouse it will be necessary for growers to grade their tobacco on the farm, and in this connection the Commercial Branch of the B.S.A. Company has issued the following circular, which applies to the crop now being cured:—

“ With reference to the circular issued from this office on the 18th December last, I am directed to inform you that the re-ordering machine, therein referred to, is in course of erection, and in order to facilitate the handling of the present season's crops it is essential that all leaf sent to the Warehouse be graded on the farm. The most satisfactory method to adopt is to grade the leaf of each barn, as it is being baled, into three or four grades, according to size and colour. It is not necessary for the grades of one barn to correspond with the grades of another, as on arrival at the Warehouse each bale will be inspected by the classifier and placed in the standard grade of a similar quality. In this way a grower of, say, 30,000 lbs., will, on completion of grading, have ten to fifteen different grades, but will not have been encumbered with the sorting into more than three or four grades at any one time. On completion of grading, the leaf should be tied into hands, which should not exceed  $1\frac{1}{4}$  inches at each butt end. It must also be clearly understood that the conditions in regard to classification and pooling, which are set forth in the circular issued by the Tobacco Planters' Association, and dated the 20th December, 1913, will apply to the 1914 crop. Any grower who desires his leaf to be separately treated must advise the Warehouse at the time it is sent in, but graded and pooled leaf will receive priority in treatment, and the tariff of charges will not apply to leaf sent in for separate treatment. Such leaf will be handled as circumstances permit, and charged for according to the time and labour involved in its preparation. The Com-

pany accepts no responsibility for delay in handling such leaf, or for deterioration arising through such delay."

Since the foregoing circular was issued the B.S.A. Company has, for the present, agreed not to enforce the condition in regard to the tobacco being tied into hands at the farm, and in so far as the present crop is concerned the leaf may be sent to the Warehouse loose. Tied leaf will, however, receive priority of treatment, and leaf so sent in will pay lower Warehouse charges, while since growers can receive no advances until their leaf has entered the standard grades, those planters who do not tie their tobacco into hands on the farm will necessarily be delayed in the matter of advances.

Some growers object to being compelled to grade their tobacco on the farm, but the B.S.A. Company emphasises the fact that it is in the interests of the growers and of the industry that this should be done. The Company, it is stated, has incurred heavy additional outlay in providing a machine to dry and re-order the leaf, and if growers' crops are to be treated under the old system it will be impossible to handle the leaf in the quantities required to keep the machine running under an economical load.

At the time of writing practically the whole of the capital required for the flotation of the Rhodesia Tobacco Planters Co-operative Society has been subscribed, and we expect that by the time this *Journal* appears the society will have proceeded to allotment.



## Correspondence.

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### HINTS ON BRICKMAKING.

To the Editor,

*Rhodesia Agricultural Journal.*

Dear Sir,

I think it would be better if Mr. G. T. Dyke in future refrained from advising people not to use ant-heap. The season before last I, against my own inclinations, left ant-heap alone and used yellow sub-soil. The result was disastrous. I lost 27,000 bricks through cracking. Of course, it will be said that I did not use the right sub-soil. Well, what is?

This past season I used ant-heap, and out of one single ant-heap I made 40,000 bricks of excellent quality. This fact, I think, ought to remove Mr. Dyke's objection to ant-heaps not being large enough to warrant starting on one. I have the idea that he is thinking of the tiny things they call ant-heaps down in the South, and not the miniature kopjes we have to deal with here.

Yours, etc.,

J. M. GORDON.

Golden Kopje,

19th February, 1914.

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### REPLY.

If Mr. Gordon will kindly re-read my article on brick-making he will see that I do not advise people *not* to use ant-heap; on the contrary, I say ant-heap makes good bricks, but if, as is the case on some farms, ant-heap is not available, then I have found yellow sub-soil excellent, but it all depends on the amount of sand used and the mixing.



A good crop of Tobacco at Mr. J. Hemmerley's farm, Laurels, Marandellas.



Tobacco Transplanter at work, Darwendale.





I notice another correspondent finds the table too expensive. Two of my friends who recently made bricks on my lines used 9 in. by 1½ in. deals fixed on packing cases, and after using them for the brick-making, used the boards, which were not damaged in any way, for wagon bottoms, so that the table cost nothing.

I shall always advise making bricks on a table; even natives work better at a table than in a dagga hole.

GEORGE T. DYKE.

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### KRAALING OF CATTLE.

To the Editor,

*Rhodesia Agricultural Journal.*

Dear Sir,

Some considerable time ago an article appeared in your pages from the pen of a Rhodesian rancher, bearing upon the care and management of cattle. In the course of the article in question, the gentleman went on to denounce the "barbarous" custom of kraaling cattle over-night, giving it as his opinion that as the kafir had started the "barbarity," so the white man had continued, and each new arrival simply did as his neighbour did, and so on.

This candour appearing in your columns as it did might well be expected to impress someone, and, speaking for myself—well, it "got" me.

Feeling quite progressive, I waded in and fenced a paddock of 100 acres, turning my working bullocks inside this enclosure at nights in true progressive style, believing that everything was all right in the garden. Well, I had some lions around on Sunday night last, and I am now minus two bullocks, so I am now kraaling my oxen at nights, and have given up progressive ideas.

Of course, you do not associate yourself with the views of correspondents, but the advice given was in the form of an article, and it was good enough, at least, for me.

People who go into print with advice should, I think, weigh well their responsibility, likewise the person or persons responsible for the publication thereof. If by your permission this meets the eye of any new settler, he will, I hope, for his own pocket's sake, take a hint and stick to the old "barbarous" custom.

I would add, in conclusion, that the fence was a barbed six-wire "Lochrin" cattle fence, and in perfect order. The lions jumped over. I may say, in this connection, that I poisoned one (a lioness) 9 ft. 1 in. tip to tip.

Yours, etc.,

J. M. GORDON.

Golden Kopje,

17th January, 1914.

P.S.—I beg to state that, although farmers and stock-owners will naturally never miss any opportunity of destroying lions, I am of the opinion that the reward recently discontinued was a great incentive to others to help. The stoppage of rewards constituted the limit in meanness, and, as usual, no reasons were given or explanations considered necessary.—J.M.G.

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### PLOUGHING NEW LAND.

To the Editor,

*Rhodesia Agricultural Journal.*

Dear Sir,

In response to your invitation inviting communications affecting the farming interests, and in view of an article appearing in the *Bulawayo Chronicle* of the 5th inst., entitled "Ploughing Wrinkles," regarding the correct depth at which to "break" new land, I would suggest that farmers in different parts of the Territory give their experiences in this connection for the benefit, not only of the intending settler, but for the "old hand" as well.

My method, up to the present, has been to plough to an average depth of 12 in. in breaking up new land, and to cross-

plough at a less depth. I have found this work quite well in my soil, as the ground yields a fair crop the second season.

Perhaps the officer in charge of this Department would also give us the benefit of his experiences in this connection on the Government Experimental Farm, as one hears of so many different systems, each of which is claimed to be the best.

Yours, etc.,

J. K. MACDONALD.

Riverside,  
Nyamandhlovu,  
10th February, 1914.

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#### REPLY.

The Agriculturist and Botanist furnishes the following notes:—The tillage operations entailed in the preparation of land cannot be governed in detail by hard and fast rules. Due consideration must always be given to the class of land worked, whether heavy or light, and the season of the year when the ground is being broken up. Usually it is more common to cross-plough a little deeper than the original ploughing, and not *vice versa*. The turning up of a large amount of unmellowed and possibly acid sub-soil should be avoided unless the land will lie fallow for a considerable time before being cross-ploughed and prepared for cropping. The comparatively poor results usually obtained from first year land is explained by the fact that the soil has not had time to become properly aerated and mellowed, and also because the large amount of undecayed organic matter in the form of plant roots adversely affects the tilth and increases loss of moisture by evaporation.

The deeper the land is ploughed the more sub-soil is brought to the surface, and the deeper the surface soil is buried. The more sub-soil brought to the surface, the longer the time required for this to mellow, since the ingress of air, warmth, frost, and moisture are the factors pro-



moting mellowness, good tilth, and the availability of plant food in the soil.

It will thus be seen that the depth of breaking land should be regulated according to the period which will elapse before such land will be seeded and the amount of cultivation which can be given it between these two dates. The more the land is worked, the quicker the soil will become mellow and fit for cropping. In practice, and within limits, it is usually desirable that each ploughing should be a little deeper than the previous one, so that each time a little more sub-soil will be brought to the surface and intermingled with the already "sweet" and mellowed soil. Due consideration must, of course, however, be given to the adequate burying of any herbage growing on the land.

*Note.*—We shall be very pleased to publish the experiences of any of our readers who communicate with us on this subject.—Ed.

## The Agricultural Outlook.

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The rains throughout the Territory set in very late this season, and in consequence crops are rather backward. There is a danger of frost doing damage in some parts, but, generally speaking, there is a good prospect of a fair harvest, provided more rain falls in April. The Salisbury and Mazoe districts have had a favourable season, and from here an abundant mealie crop is expected. Grazing everywhere is good, and cattle are generally in thriving condition. Stock should winter well, but it is pleasing to note that farmers are not now relying entirely upon veld grazing for the sustenance of their animals, but are providing winter feed in the way of ensilage, etc.

At Marandellas, the tobacco planted early is fairly good, and curing is now proceeding. The late planting, however, is very poor, and it is doubtful whether it will mature before the frosts arrive. In the Hartley district there was a serious shortage of rain during the months of December and January, and although the rainfall in February was excellent, it came too late to save all crops, and from here a two-thirds harvest is expected. The mealie crop in the Victoria district is, with few exceptions, exceedingly late, and it depends upon there being no frost until well into June whether the majority of farmers will get anything at all. There are, however, some more fortunate farmers who managed to carry on through the drought, but with an approximate 25 per cent. loss through tasselling. Other cereal crops are fair, while ground nuts, especially on the lighter soils, look promising. The rains have been extraordinarily patchy, for 30 inches are reported as having fallen 20 miles from the township, whilst there only 17 inches are recorded. Provided early frosts do not come, a fair maize crop is expected throughout the Gwelo district. Potatoes are doing well. Stock generally are healthy, and in splendid condition. The veld is better than it has been for three years, and all stock should winter well. In the vicinity of Bula-

wayo, the first sowing of the grain crop failed, but the second sowing at present gives fair promise. Beans and potatoes are doing very well, and the latter especially promise a very good crop. The rains have brought on the grazing wonderfully, and stock are in good condition. At Wankies, copious rains have fallen since the middle of January, and although a good many crops were damaged by heavy rains, necessitating replanting, these now promise well. At Nyamandhlovu, the crops are, on the whole, poor. Some farmers have quite good crops, but others have none at all. This is owing to the exceedingly local nature of the rains, and some farmers were so badly treated that they were only able to sow their crops at the beginning of March. Good rains fell during January and February in the Bubi district, and the prospects for the approaching harvest are fairly good. Grazing is generally plentiful, and stock are in good condition.

The crops within a ten miles radius of Essexvale are very poor, and if the frosts come early there will be little to reap. At and near Heany Junction and the Balla Balla districts the crops are very good, and a good harvest is anticipated. At Umzingwane, as at other places, the harvest prospects depend upon the frosts. Should they arrive late very good crops will be reaped, but in any case the harvest will be a better one than that of last year. Stock are in excellent condition, and no loss of any kind occurred during the drought. In the Plumtree district the crops are extremely variable; in some parts they are good and in others very poor. With the continuance of favourable weather there will probably be a small harvest. Stock are in excellent condition, and the losses during the drought have not been great. The crops in the Gwaai district are very good indeed, and providing there are no early frosts, and rains continue into April, a good harvest may be expected. At Figtree, the crops, although somewhat late, are up to the average. Grass and water are plentiful, and should be sufficient to tide over the dry season. Belingwe has had a favourable season, and good crops are expected. At Gwanda, stock in all parts of the district are in excellent condition. Grazing is good and plentiful, and there should be no anxiety as to a shortage during the winter months.



# Veterinary Report.

January, 1914.

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## SALISBURY.

AFRICAN COAST FEVER.—There were no fresh cases during the month.

ANAPLASMOSIS.—A large number of cases were reported during the month, the animals mostly affected being imported colonial-bred stock. Six animals, two Devon bulls and four Devon heifers, inoculated against redwater and gallsickness re-acted severely, but recovered. Five bulls and three heifers are now under treatment.

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## BULAWAYO.

AFRICAN COAST FEVER.—No further developments. The last case of disease in the district occurred in May, 1913.

TUBERCULOSIS.—The two animals referred to in the report for December were destroyed. *Post-mortem* examination confirmed the diagnosis of tuberculosis.

HORSE-SICKNESS INOCULATION.—Five mules inoculated. No deaths.

MALLEIN TEST.—The following animals were tested with mallein on importation and found free from glanders (Plum-tree included):—Mules, 16; donkeys, 62.

IMPORTATIONS.—From the Union of South Africa:—Mules, 16; donkeys, 62; heifers, 176; bulls, 72; sheep and goats, 5,898; ostriches, 56. From Northern Rhodesia. *via* Victoria Falls:—Oxen, 320; cows, 50.

## UMTALI.

AFRICAN COAST FEVER.—At N'Odzi, seven head of cattle were destroyed, bringing the total mortality to 128.

IMPORTATIONS.—Seventeen head of slaughter stock, ex Macequece.

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## GWELO.

ANTHRAX.—A suspected outbreak of anthrax was reported at Que Que, but on investigation no symptom of this disease was discovered. The animals affected were young calves, and the cause of death was apparently diarrhœa.

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## HARTLEY.

TRYPANOSOMIASIS.—A large number of cases of this disease in cattle were reported in the Gatooma portion of the district; also an outbreak amongst pigs on a farm near Hartley. The Veterinary Bacteriologist reports that smears from cattle on one of the infected farms shewed trypanosomes of a different species to that generally found in infected animals in this district. They resemble *T. Vivax* or *T. Caprae* (Bruce). Thirty affected animals were treated by intrajugular injection; the results are very promising.

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All other districts reported free from infective disease.

J. M. SINCLAIR,

Chief Veterinary Surgeon.

# Veterinary Report.

February, 1914.

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## SALISBURY.

AFRICAN COAST FEVER.—One case occurred in the previously infected herd, and another in a small herd adjoining, which until now has been free from disease.

PLASMOSES INOCULATION.—Eight imported animals were discharged after successful inoculation.

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## BULAWAYO.

HORSE-SICKNESS INOCULATION.—Thirty mules inoculated. Four deaths.

MALLEIN TEST.—The following animals were tested with mallein on importation, and found free from glanders:—Mules, 8; donkeys, 92.

IMPORTATIONS.—From the Union of South Africa:—Heifers, 119; bulls, 16; sheep and goats, 3,143; pigs, 5. From Northern Rhodesia, *via* Victoria Falls:—Oxen (slaughter), 20.

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## GWELO.

HORSE-SICKNESS.—Three deaths reported.

PIGS.—A somewhat heavy mortality occurred amongst the pigs at the Gwelo Creamery; the cause is as yet undetermined, but is suspected to be of dietetic origin.



## UMTALI.

AFRICAN COAST FEVER.—At N'Odzi, eight head were destroyed, bringing the total mortality to date to 136 head.

POULTRY.—One crate of fowls was refused permission to enter the territory because diseased.

IMPORTATIONS.—Thirty-one head of slaughter cattle, ex Macequece.

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All other districts reported free from contagious disease.

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## ARSENICAL POISONING.

The mortality amongst domestic animals from arsenical poisoning is increasing at an alarming rate, and the attention of stockowners is directed to the necessity of keeping cattle dip and other preparations containing arsenic under lock and key. The greatest carelessness is frequently displayed in leaving such preparations readily accessible to animals. In two cases recently investigated by the Department, over forty head of cattle died through tins of pure dip being left on the veld.

J. M. SINCLAIR,

Chief Veterinary Surgeon.

# Garden Calendar.

April and May.

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By N. L. KAYE-EDDIE.

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## FLOWER GARDEN.

Most flowers which have bloomed during the summer months now gradually cease flowering, and the beds will require well working up before winter flowering plants are put in. Dahlias and chrysanthemums will now cease blooming, and should be cut down as soon as the stems shew decay. Carnations require attention, and should be kept free of old blooms, especially if they shew signs of rust from continual rains. The ground around the stems should be kept free and loose. If the ground has been well manured or mulched, this will greatly assist in keeping in the moisture during the cold, dry months which follow; and it must not be forgotten that the constant stirring of the surface is also advantageous to this end.

Sweet peas, if not already sown, should be planted during April. Choose a site against a fence or trellis, otherwise plant in rows, as the plants attain a height of over 6 feet, and must be staked. Sow the seeds from 4 to 6 inches apart. The soil should be trenched and thoroughly worked and manured. As the plants will require a lot of water and attention later, convenience of both should be considered.

Cuttings may be planted from most perennials and shrubs. Hardwood cuttings are best taken when it is seen that the sap is down. They should be kept warm and moist, care being taken in watering to give just sufficient moisture, as an excess tends to rot the cutting, especially if there is much organic matter in the soil used.

## VEGETABLE GARDEN.

Potatoes require ridging and tomatoes staking and tying up. Potatoes which mature after the rains may generally remain in the soil and be lifted as required. Vegetables planted out for winter crops should be well and continuously cultivated, which will bring them along quicker with less watering. Beans and peas should be staked and tied. Beans, cabbage, cauliflower, peas, turnip, spinach, beet and radish should be sown for late winter crops.



## Market Reports.

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The produce market at Salisbury is glutted with all lines. There is no sale for mealies. The potato crop now coming in is expected to yield 20,000 bags, which is considerably more than can be disposed of in this part of the country.

There is a good demand in Salisbury for breeding stock, but none for trek oxen. Mules and horses are not sought after, while donkeys are a drug on the market. There is plenty of butter on offer locally, but people are mainly consuming the imported article.

There have been numerous stock sales during the last two months. At Gwelo, on the 5th February, Messrs. H. K. Pinches & Co. disposed of 450 head of oxen on behalf of the B.S.A. Company. At the conclusion of this sale, Messrs. Pinches & Co. sold some 500 head of cattle, the property of various owners. Amongst these was a large supply of slaughter stock, which was bought up at 42s. 6d. per 100 lbs. Young untrained oxen were also in good demand, but there seemed to be a fall in the demand for trek oxen. Native and grade breeding stock were standing at a higher figure than at any time during the previous six months. Some 25 young cross-bred Shorthorn and North Devon bulls found a ready sale at 15 guineas. At the Marandellas Trading Co.'s sale at Marandellas, on the 7th February, half-bred cows fetched £17 10s.; half-bred heifers, £15; Mashona cows with calves, from £9 to £10 5s.; Mashona cows without calves, from £8 to £10; Colonial heifers, from £8 10s. to £10; Mashona heifers, £7 5s. Slaughter cattle were sold at about 40s. per 100 lbs. There was no demand at all for trek oxen; although 200 head were offered, none were sold. There was a good demand for breeding stock, especially for local cows and heifers.

The cattle sale conducted by Mr. A. G. Hay, at Plumtree, on the 28th February, was a very great success. A very good

assortment of stock was put up, and about 750 head realised nearly £8,000. There was a large selection of native cattle from the Ross Estate, and other sellers. Some excellent Short-horn grade heifers (18 months and under) by Mr. A. Barclay (Redhill) fetched as much as £16 each. Milking cows fetched good prices, the calves running with them being, in most cases, the attraction. Some Hereford bulls and grade heifers bred by Mr. F. Rayner (Tjompani) went at good prices. Trek and slaughter oxen were not put up in such large numbers as is usual at Plumtree sales, but the demand was good, and they fetched very satisfactory prices. In addition, there were some pure-bred Shorthorn bulls (Cooper's), mules, etc., on sale.

At Gwelo, on the 2nd March, Mr. A. E. White held a successful sale. As is to be expected at this time of the year, slaughter stock was down considerably, but breeding stock was firm and fetched good prices. Good young cows and heifers in calf realised from £18 to £32 10s. each. The record price for any single animal sold in Gwelo was £66, which was paid by Mr. Theo Haddon for a fine four-year-old Shorthorn bull. The following were the prices realised:—Native heifers, £5 to £6 5s.; native cows, £6 5s. to £8; native trek oxen (young), £6 5s. to £7; native trek oxen (large), £8 10s. to £10 5s.; Africander-Shorthorn heifers, £12 10s. to £16 10s.; Friesland heifers, £17 to £18; young Colonial cows in calf, £18 to £32 10s.; cross-bred Colonial cows, £12 to £15 10s.; Shorthorn bulls, £30 to £66; Africander bulls, £15 to £25; donkey mares with foals, £8 to £10; slaughter oxen, about 40s. per 100 lbs.

Messrs. Boggie & Co. held their quarterly stock sale at Gwelo on the 16th inst. About 800 head of cattle were in the sale yards, and there was a good attendance of buyers. A special feature of the sale was a very choice lot of 40 heifers imported from the Colony, all of which were specially selected, and consisted of pure-bred Frieslands, graded Africanders and Shorthorns, with a few Herefords. The Frieslands were the favourites, and bidding was brisk immediately they entered the sale ring. All were soon disposed of, the highest price realised being £22. The second highest price was £19 10s., and the average price was about £18. The remainder, consisting of Africanders and Shorthorns, were knocked down to various

buyers at prices ranging from £10 to £12. The lowest price was for a small lot of three at the end of the sale, which realised £7 10s. each. There were only a few good dairy cows, for which, as usual, there was keen competition. The highest price realised was £25. Some other promising cows realised £10 to £12 10s. There were no good bulls at the sale, and there appeared to be no buyers for any bulls except Friesland, of which there were none, and some buyers who attended for the purpose of getting this class were disappointed. There was a slight improvement in the price of Mashona cows, some rather superior animals realising £10. There was a falling off in the price of slaughter stock, and there was very little demand for trek oxen. Some spans of heavy trek or slaughter animals were withdrawn at £10. Small sized trek or slaughter stock were sold for £7. A small number of ten months' old Mashona calves were withdrawn at 30s. In all, about 500 head of cattle were disposed of. Practically the only animals not sold were slaughter and spans of trek oxen, which are to be placed on the mid-winter cattle sale, which takes place in June.



| Article.                        | Johannesburg. | Kimberley. | Bulawayo.      | Salisbury. |
|---------------------------------|---------------|------------|----------------|------------|
| Barley, 150 lbs. -              | 9/6 12/6      | —          | —              | 22/6 25/0  |
| Beans, 203 lbs. -               | 16/0 36/0     | —          | —              | 23/0 24/0  |
| Boer Meal, unsifted, 200 lbs. - | —             | —          | 41/0 42/0      | 37/6       |
| Bran, wheaten, 100 lbs. -       | 7/6 7/9       | —          | 12/0 13/0      | 16/6       |
| Flour, 100 lbs. -               | —             | —          | 25/0           | 18/6 23/0  |
| „ Colonial, 100 lbs. -          | —             | —          | 23/6 24/6      | none       |
| Forage, 100 lbs. -              | 4/6 5/0       | 4/3 4/6    | 10/0 11/0      | 5/9 6/0    |
| „ Colonial Oat -                | 4/9 5/0       | 10/6       | —              | none       |
| Hay -                           | Bale. 5d. 6d. | —          | Ton. 65/0 75/0 | 35/0 50/0  |
| Kaffir Corn, 200 lbs. -         | 10/0 13/9     | 12/0       | 17/0 18/0      | none       |
| Manna, 100 lbs. -               | 4/0 4/9       | —          | —              | 3/6 5/0    |
| Mealies, S.A. White, 203 lbs. - | 8/3 9/0       | 8/6 10/3   | 13/0 14/0      | 9/0 9/6    |
| Mealies, Yellow, 203 lbs. -     | 7/10 8/3      | —          | 12/0 13/6      | none       |
| Mealie Meal, White, 183 lbs. -  | —             | —          | —              | 9/0 10/0   |
| Munga, 200 lbs. -               | —             | —          | —              | 12/6 13/0  |
| Monkey Nuts, bag -              | —             | 11/6       | 11/6 12/6      | 7/6 8/0    |
| Oats, 150 lbs. -                | 8/6 10/3      | —          | —              | 23/0 24/0  |
| Onions, 120 lbs. -              | 7/0 8/6       | 4/0 7/6    | —              | 20/0       |
| Peas, 200 lbs. -                | 21/0 22/6     | —          | —              | none       |
| Potatoes, new, 150 lbs. -       | 10/0 11/6     | 6/0 21/0   | 18/6 19/6      | 8/0 9/0    |
| „ old, 150 lbs. -               | 3/6 9/0       | —          | —              | none       |
| Rapoko -                        | —             | —          | —              | 10/0       |
| Rye, 200 lbs. -                 | 18/6 19/0     | —          | —              | 25/0       |
| Salt, 200 lbs. -                | 3/6 4/9       | —          | 10/0 11/0      | 11/6 12/6  |
| Wheat, 203 lbs. -               | 20/0 22/0     | —          | —              | 28/0 30/0  |
| Butter, local, per lb. -        | 9d. 1/1½      | 10d. 1/3   | 9d. 1/2        | 1/3 1/9    |
| Eggs, local, per dozen -        | 1/2 1/6       | 9d. 1/7    | 3/0 3/6        | 3/6 4/0    |
| Ducks, each -                   | 1/9 2/9       | 2/4 3/4    | —              | 4/6 5/0    |
| Fowls, each -                   | 10d. 3/0      | —          | —              | 3/0 4/0    |
| Geese, each -                   | 2/6 3/9       | —          | —              | 9/0 11/0   |
| Turkeys, cocks, each -          | 6/6 14/6      | 4/6 10/0   | —              | 15/0 17/6  |

## LIVE STOCK.

|                              |           |           |               |             |
|------------------------------|-----------|-----------|---------------|-------------|
| Slaughter Cattle, 100 lbs. - | £11 £14   | 32/6      | 37/6 40/0     | £2          |
| Trek Oxen, trained -         | £6 £8     | £8        | £7/5 £11      | £10 £12     |
| Local Cows, milk -           | —         | —         | £17/10 £30/10 | £15 £17/10  |
| Dairy Cows -                 | £16 £26   | £15 £25   | £20 £32       | £25 £30     |
| Native Cows -                | —         | —         | —             | £8/10 £10   |
| Heifers, Colonial -          | £6        | £6 £7/10  | £8 £17        | £9/9 £10/10 |
| „ Native -                   | —         | —         | —             | £6 £7       |
| Pigs, live weight -          | 2d. 5d.   | 3d.       | 4d. 5d.       | 4d.         |
| Horses, riding, salted -     | —         | —         | —             | £30 £35     |
| „ „ unsalted -               | £15 £30   | £17 £25   | £15 £35       | £22 £27/10  |
| Mules, inoculated -          | £20 £30   | £18 £25   | £30 £40       | £25 £27/10  |
| Donkeys, geldings -          | £5 £6     | —         | £7 £8/10      | £6 £7       |
| „ mares -                    | —         | —         | £8/10 £10/10  | £8 £9       |
| Goats -                      | 10/0 16/0 | 12/0 15/0 | —             | 11/0 12/6   |
| Persian Ewes -               | —         | —         | —             | 21/0 22/6   |
| Cross-bred Ewes -            | —         | —         | —             | 17/6 £1     |
| Sheep, slaughter -           | 15/0 18/6 | 12/6 17/6 | 15/0 £1       | 25/0 27/6   |

# Weather Bureau.

## TEMPERATURES.

| STATION                               | JANUARY      |              | FEBRUARY     |              |
|---------------------------------------|--------------|--------------|--------------|--------------|
|                                       | Mean<br>Max. | Mean<br>Min. | Mean<br>Max. | Mean<br>Min. |
| MASHONALAND—                          |              |              |              |              |
| Hartley, Gatooma ...                  | 89·4         | 64·6         | 81·78        | 64·46        |
| „ Giant Mine ...                      | 88·2         | 66·26        | 83·61        | 65·5         |
| „ Hallingbury Farm ...                | 86·8         | 63·1         | 81·1         | 63·8         |
| Lomagundi, Eldorado Mine ...          | 88·39        | 67·26        | 82·18        | 67·5         |
| „ Kanyemba ...                        | 94·35        | 71·5         | —            | —            |
| „ Sinoia ...                          | 87·74        | 64·12        | 83·0         | 64·17        |
| „ Sipolilo ...                        | 85·9         | 63·83        | 82·9         | 63·1         |
| Makoni, River Junction ...            | —            | —            | —            | —            |
| Mazoe, Shamva Mine ...                | 87·28        | 65·73        | 83·1         | 66·11        |
| Melsetter ...                         | 76·1         | 54·9         | 73·8         | 54·6         |
| „ Mount Selinda ...                   | 78·18        | 61·62        | 69·9         | 63·04        |
| „ Vermont ...                         | —            | —            | —            | —            |
| Salisbury, Agricultural Laborat'y ... | —            | —            | —            | —            |
| „ Chishawasha ...                     | —            | —            | 76·8         | 61·8         |
| „ The Gaol... ...                     | —            | —            | 78·8         | 58·2         |
| Umtali, Chiconga's Location ...       | 85·7         | 63·2         | 82·6         | 63·8         |
| „ Public School ...                   | 86·2         | 63·8         | 81·5         | 63·8         |
| Victoria ...                          | 86·16        | 66·25        | 80·1         | 65·32        |
| MATABELELAND—                         |              |              |              |              |
| Bulawayo, Essexvale ...               | 87·29        | 65·41        | 78·14        | 65·0         |
| „ Observatory ...                     | 85·8         | 62·0         | 76·5         | 62·6         |
| „ Rhodes Matopo Park... ...           | 91·83        | 63·03        | —            | —            |
| Gwelo, The Gaol ...                   | 84·36        | 62·42        | 77·24        | 61·7         |
| Mangwe, Empandeni ...                 | 92·4         | 57·3         | 82·6         | 54·0         |
| Tuli ...                              | 101·2        | 71·7         | 89·42        | 69·03        |
| Wankie, The Hospital ...              | 96·64        | 71·72        | 85·03        | 69·63        |
| Victoria Falls ...                    | —            | —            | 76·6         | 64·2         |

## RAINFALL.

| STATION              | January | February |
|----------------------|---------|----------|
| MASHONALAND :        |         |          |
| Charter—             |         |          |
| Driefontein ...      | 4·83    | 6·97     |
| Enkeldoorn ...       | 3·37    | —        |
| Grootfontein ...     | 4·52    | —        |
| Marshbrook ...       | 3·76    | 5·87     |
| The Range ...        | 3·75    | 10·97    |
| Riversdale ...       | 1·65    | 7·56     |
| Umvuma (Railway) ... | 3·26    | 6·67     |

## RAINFALL—(Continued).

| STATION                   |     |     |     | January | February |
|---------------------------|-----|-----|-----|---------|----------|
| MASHONALAND—(Continued)   |     |     |     |         |          |
| Hartley—                  |     |     |     |         |          |
| Ardgowan                  | ... | ... | ... | 6·00    | 9·63     |
| Battlefields (Railway)    | ... | ... | ... | 0·32    | 13·64    |
| Beatrice Mine             | ... | ... | ... | 6·55    | 7·00     |
| Carnock Farm              | ... | ... | ... | 4·02    | 9·27     |
| Norton Siding             | ... | ... | ... | 5·78    | 10·18    |
| Elvington                 | ... | ... | ... | 5·11    | 7·28     |
| Franceys                  | ... | ... | ... | —       | 6·24     |
| Gatooma                   | ... | ... | ... | 6·53    | 10·03    |
| Gatooma (Railway)         | ... | ... | ... | 6·42    | 9·16     |
| Giant Mine                | ... | ... | ... | 6·68    | 14·50    |
| Gowerlands                | ... | ... | ... | 7·29    | 8·14     |
| Hallingbury               | ... | ... | ... | 6·94    | 8·22     |
| Hartley (Railway)         | ... | ... | ... | 5·45    | 8·57     |
| Impofhoe                  | ... | ... | ... | 5·60    | 10·45    |
| “Jenkinstown”             | ... | ... | ... | 6·60    | 6·01     |
| Makwiro                   | ... | ... | ... | 6·78    | 8·67     |
| Shagari                   | ... | ... | ... | —       | —        |
| “Stoneygate”              | ... | ... | ... | 4·07    | 7·54     |
| Lomagundi—                |     |     |     |         |          |
| Banket Junction (Railway) | ... | ... | ... | 9·01    | 6·84     |
| Darwendale                | ... | ... | ... | 5·45    | —        |
| Duxbury Farm              | ... | ... | ... | 6·18    | —        |
| Eldorado Mine             | ... | ... | ... | 7·40    | 14·72    |
| „ (Railway)               | ... | ... | ... | 6·41    | 12·89    |
| Golden Kopje Mine         | ... | ... | ... | 6·44    | —        |
| Kanyemba                  | ... | ... | ... | 4·13    | —        |
| Longmead                  | ... | ... | ... | 6·96    | 12·55    |
| Palm Tree Farm            | ... | ... | ... | 7·51    | 8·00     |
| Sinoia                    | ... | ... | ... | 6·97    | —        |
| Sipolilo                  | ... | ... | ... | 7·60    | 7·52     |
| Umvukwe Ranche            | ... | ... | ... | 6·94    | 10·37    |
| Makoni—                   |     |     |     |         |          |
| Chimbi Source             | ... | ... | ... | 9·28    | 5·74     |
| Eagle's Nest              | ... | ... | ... | 5·05    | 11·67    |
| Ellavale                  | ... | ... | ... | 2·91    | 5·47     |
| Inyanga                   | ... | ... | ... | 5·33    | 5·93     |
| Mona                      | ... | ... | ... | 6·03    | 6·61     |
| Monte Cassino Mission     | ... | ... | ... | 5·79    | 10·99    |
| Odzi (Railway)            | ... | ... | ... | 4·55    | 3·95     |
| River Junction            | ... | ... | ... | —       | —        |
| Rusape (Railway)          | ... | ... | ... | 8·19    | 9·28     |
| Springs                   | ... | ... | ... | 6·36    | 9·78     |
| St. Trias' Hill           | ... | ... | ... | 5·98    | 8·24     |
| York Farm                 | ... | ... | ... | —       | —        |
| Mangwendi—                |     |     |     |         |          |
| Bonongwe                  | ... | ... | ... | 4·65    | 9·04     |
| Glen Somerset             | ... | ... | ... | 6·14    | 10·18    |
| Land Settlement Farm      | ... | ... | ... | 3·48    | 6·53     |
| Macheke (Railway)         | ... | ... | ... | 10·59   | 14·54    |
| Marandellas               | ... | ... | ... | 7·99    | 13·21    |



## RAINFALL—(Continued).

| STATION                           |     |     |     | January | February |
|-----------------------------------|-----|-----|-----|---------|----------|
| MASHONALAND—(Continued)           |     |     |     |         |          |
| Mangwendi (Continued)             |     |     |     |         |          |
| Marandellas (Railway)             | ... | ... | ... | —       | 13·52    |
| Mrewa                             | ... | ... | ... | —       | —        |
| Mungo                             | ... | ... | ... | 6·34    | 9·26     |
| Rusawi Outspan                    | ... | ... | ... | 9·70    | 12·81    |
| Selous Nek                        | ... | ... | ... | 10·11   | 9·76     |
| Tweedjan                          | ... | ... | ... | 7·70    | 11·70    |
| Mazoe—                            |     |     |     |         |          |
| Avonduur                          | ... | ..  | ... | 6·89    | 10·41    |
| Bindura                           | ... | ... | ... | 6·31    | 9·85     |
| Bindura (Railway)                 | ... | ... | ... | 7·25    | 9·16     |
| Ceres                             | ... | ... | ... | 5·93    | 9·85     |
| Chipoli                           | ... | ... | ... | 7·89    | 5·36     |
| Claverhill                        | ... | ... | ... | 5·71    | 8·33     |
| Darwin                            | ... | ... | ... | 7·33    | 4·54     |
| Dunmaglas                         | ... | ... | ... | 6·57    | 9·42     |
| Laguaha                           | ... | ... | ... | 8·12    | 7·03     |
| Lowdale                           | ... | ... | ... | 5·18    | 9·06     |
| Mazoe                             | ... | ... | ... | 8·33    | 8·72     |
| Mguta Valley                      | ... | ... | ... | 4·73    | 10·97    |
| Omeath                            | ... | ... | ... | 1·96    | —        |
| Ruia                              | ... | ... | ... | 8·87    | —        |
| Shamva                            | ... | ... | ... | —       | —        |
| „ Mine                            | ... | ... | ... | 8·88    | 4·35     |
| Sunnyside                         | ... | ... | ... | 8·15    | 10·73    |
| Teign                             | ... | ... | ... | 7·14    | 16·16    |
| Umvukwe Flats                     | ... | ... | ... | 10·41   | —        |
| Waterfall Farm                    | ... | ... | ... | —       | —        |
| Melsetter—                        |     |     |     |         |          |
| Chipinga                          | ... | ... | ... | 9·52    | 13·01    |
| Helvetia                          | ... | ... | ... | —       | 13·96    |
| Melsetter                         | ... | ... | ... | 9·36    | 10·37    |
| Mount Selinda                     | ... | ... | ... | 14·33   | 16·65    |
| Mutambara Mission                 | ... | ... | ... | —       | —        |
| Pasture                           | ... | ... | ... | 7·27    | 4·00     |
| Tom's Hope                        | ... | ... | ... | 6·71    | 14·98    |
| Vermont                           | ... | ... | ... | 12·98   | —        |
| Salisbury—                        |     |     |     |         |          |
| Avondale                          | ... | ... | ... | 5·86    | 9·30     |
| Brookmead                         | ... | ... | ... | —       | —        |
| Chishawasha                       | ... | ... | ... | 7·89    | 9·31     |
| Cleveland Reservoir               | ... | ... | ... | 8·77    | 9·13     |
| Convent                           | ... | ... | ... | —       | —        |
| Goromonzi                         | ... | ... | ... | 10·58   | 9·86     |
| Gwibi                             | ... | ... | ... | —       | —        |
| Lilfordia                         | ... | ... | ... | 5·67    | —        |
| Meadows                           | ... | ... | ... | 10·49   | 10·36    |
| Salisbury Agricultural Laboratory | ... | ... | ... | —       | —        |
| „ (Club)                          | ... | ... | ... | 8·19    | 12·10    |
| „ (Gaol)                          | ... | ... | ..  | —       | 12·33    |

RAINFALL (*Continued*).

| STATION                 |     |     |     | January | February |
|-------------------------|-----|-----|-----|---------|----------|
| MASHONALAND—(Continued) |     |     |     |         |          |
| Salisbury (Continued)   |     |     |     |         |          |
| Salisbury (Railway)     | ... | ... | ... | 9·66    | 14·36    |
| Sebastopol              | ... | ... | ... | 9·52    | 9·18     |
| Selby                   | ... | ... | ... | 4·67    | —        |
| Westridge               | ... | ... | ... | 7·06    | 10·53    |
| Umtali—                 |     |     |     |         |          |
| Chiconga's Location     | ... | ... | ... | 3·42    | 2·95     |
| Hanyanya (Bikita)       | ... | ... | ... | 12·32   | 17·11    |
| Odzani                  | ... | ... | ... | 3·83    | 4·92     |
| Penhalonga              | ... | ... | ... | 6·56    | 7·15     |
| Premier Estate          | ... | ... | ... | 5·12    | 3·56     |
| Public School           | ... | ... | ... | 4·34    | 5·65     |
| Stralsund               | ... | ... | ... | 5·25    | 5·11     |
| Summerfield             | ... | ... | ... | 5·64    | 7·95     |
| Umtali (Railway)        | ... | ... | ... | —       | 4·4      |
| Victoria—               |     |     |     |         |          |
| Chibi                   | ... | ... | ... | 2·12    | 7·58     |
| Chilimanzi              | ... | ... | ... | 2·27    | 5·73     |
| Chingombe               | ... | ... | ... | 3·25    | 4·26     |
| Chiredzi Ranche, Ndanga | ... | ... | ... | 7·28    | 10·58    |
| Clipsham                | ... | ... | ... | —       | —        |
| Gokomere                | ... | ... | ... | 1·84    | 6·67     |
| Gutu                    | ... | ... | ... | 5·49    | 8·96     |
| Makorsi River Ranche    | ... | ... | ... | 9·11    | 10·95    |
| Marthadale              | ... | ... | ... | 7·05    | 10·83    |
| Morgenster              | ... | ... | ... | 4·53    | 15·16    |
| Noeldale                | ... | ... | ... | 1·24    | 7·74     |
| Pamushana               | ... | ... | ... | 1·22    | 9·44     |
| Silver Oaks             | ... | ... | ... | 2·07    | 6·55     |
| Victoria                | ... | ... | ... | 3·04    | 5·75     |
| MATABELELAND :          |     |     |     |         |          |
| Belingwe—               |     |     |     |         |          |
| Anglo-French Block      | ... | ... | ... | 1·04    | 5·82     |
| Filabusi                | ... | ... | ... | 3·45    | 6·12     |
| Fort Rixon              | ... | ... | ... | 1·44    | 7·81     |
| Infiningwe              | ... | ... | ... | 3·33    | 6·32     |
| Insiza (Railway)        | ... | ... | ... | 1·53    | 6·59     |
| Shangani (Railway)      | ... | ... | ... | 1·37    | —        |
| Tamba                   | ... | ... | ... | 1·41    | —        |
| Thornville              | ... | ... | ... | 3·23    | 8·10     |
| Bubi—                   |     |     |     |         |          |
| Inyati                  | ... | ... | ... | 5·98    | 6·53     |
| Leighton                | ... | ... | ... | —       | —        |
| Lochard Experiment Farm | ... | ... | ... | 1·50    | 7·76     |
| Bulalima—               |     |     |     |         |          |
| Figtree                 | ... | ... | ... | 1·45    | 3·15     |
| Mholi (late Magot)      | ... | ... | ... | 1·96    | 3·63     |
| Marula                  | ... | ... | ... | 2·63    | —        |
| Solusi                  | ... | ... | ... | 2·48    | 4·43     |
| Syringa                 | ... | ... | ... | —       | 3·66     |

RAINFALL (*Continued*).

| STATION                     |     |     | January | February |
|-----------------------------|-----|-----|---------|----------|
| MATABELELAND—(Continued)    |     |     |         |          |
| Bulawayo—                   |     |     |         |          |
| Balla Balla (Railway)       | ... | ... | 1·79    | 5·05     |
| Bembesi (Railway)           | ... | ... | 2·21    | 5·83     |
| Braemar                     | ... | ... | —       | —        |
| Essexvale                   | ... | ... | 2·74    | 4·77     |
| Gwaai (Railway)             | ... | ... | 3·03    | 5·06     |
| Heany Junction (Railway)    | ... | ... | 1·88    | 8·08     |
| Hope Fountain               | ... | ... | 2·06    | 6·83     |
| Imbesu Kraal                | ... | ... | —       | —        |
| Keendale                    | ... | ... | 1·81    | 5·38     |
| Khami                       | ... | ... | 1·88    | 6·10     |
| Lower Rangemore             | ... | ... | 2·38    | 5·78     |
| Matopo Mission              | ... | ... | 2·95    | 5·04     |
| Maxim Hill                  | ... | ... | 1·24    | 3·66     |
| Melinakanda Junction        | ... | ... | 1·64    | 5·13     |
| Nyamandhlovu (Railway)      | ... | ... | 1·06    | 3·63     |
| Observatory                 | ... | ... | 2·16    | 5·54     |
| Pendennis                   | ... | ... | 1·30    | 5·86     |
| Raylton                     | ... | ... | 2·24    | 4·29     |
| Rhodes Matopo Park          | ... | ... | 1·99    | 5·35     |
| Umgusa                      | ... | ... | 2·45    | —        |
| Umkien                      | ... | ... | 1·49    | 2·91     |
| Gwanda—                     |     |     |         |          |
| Antelope Mine               | ... | ... | 1·68    | 8·21     |
| Gwanda (Gaol)               | ... | ... | 2·13    | —        |
| „ (Railway)                 | ... | ... | 2·20    | 4·54     |
| Malundi                     | ... | ... | 1·82    | 4·48     |
| Mtshabzi Mission            | ... | ... | 2·15    | 6·55     |
| West Nicholson (Railway)    | ... | ... | 2·52    | 3·74     |
| Gwelo—                      |     |     |         |          |
| Globe and Phoenix (Railway) | ... | ... | 3·35    | 8·88     |
| Gwelo (Gaol)                | ... | ... | —       | —        |
| Gwelo (Railway)             | ... | ... | 5·23    | 8·32     |
| Lalapanzi                   | ... | ... | 2·44    | 12·93    |
| Lochiel                     | ... | ... | 3·95    | 9·10     |
| Lower Gwelo                 | ... | ... | 2·43    | 6·55     |
| Que Que                     | ... | ... | 3·36    | 8·71     |
| Rhodesdale Estate           | ... | ... | 1·97    | 9·28     |
| Selukwe (Railway)           | ... | ... | 3·81    | 18·25    |
| Shangani                    | ... | ... | —       | 8·81     |
| Shawlands                   | ... | ... | —       | —        |
| Sheltered Vale              | ... | ... | 2·61    | 8·92     |
| Sikombela                   | ... | ... | —       | —        |
| Mafungabusi—                |     |     |         |          |
| Inyoka                      | ... | ... | 8·73    | 12·17    |
| Mangwe—                     |     |     |         |          |
| Empandeni                   | ... | ... | 2·50    | 4·10     |
| Garth                       | ... | ... | 3·00    | 6·11     |



RAINFALL (*Continued*)

| STATION                  |     |     |     | January | February |
|--------------------------|-----|-----|-----|---------|----------|
| MATABELELAND—(Continued) |     |     |     |         |          |
| Tuli—                    |     |     |     |         |          |
| Lamulas                  | ... | ... | ... | 4·02    | 5·39     |
| Langalanga               | ... | ... | ... | 1·23    | 6·00     |
| Makalali                 | ... | ... | ... | 1·60    | 3·40     |
| Manantji                 | ... | ... | ... | 3·74    | —        |
| Manyoni                  | ... | ... | ... | 1·28    | 5·02     |
| Mazunga                  | ... | ... | ... | 2·87    | —        |
| Tuli                     | ... | ... | ... | 3·75    | 5·51     |
| Wankies—                 |     |     |     |         |          |
| Malindi (Railway)        | ... | ... | ... | 3·96    | —        |
| Victoria Falls           | ... | ... | ... | 5·65    | 10·76    |
| Victoria Falls (Railway) | ... | ... | ... | —       | 11·7     |
| Wankies Hospital         | ... | ... | ... | 3·60    | 11·94    |
| Wankies (Railway)        | ... | ... | ... | 2·16    | 15·6     |

— No return.

# Dates of Meetings of Farmers' Associations, Southern Rhodesia

(SUBJECT TO ALTERATION)

| Name of Association              | Place of Meeting                  | Secretary                           | 1914  |             |      |
|----------------------------------|-----------------------------------|-------------------------------------|-------|-------------|------|
|                                  |                                   |                                     | April | May         | June |
| Bindura                          | Thurlow's Hotel                   | A. M. Robb                          | ..    | 10          | ..   |
| Charter-Mgezi                    | Beatrice Mine                     | W. Krienke                          | ..    | 27          | ..   |
| Central                          | Unvuma                            | N. Dainty                           | 24    | 29          | 26   |
| Enterprise                       | Arcturus Hotel                    | F. Pilgrim                          | 14    | 12          | 9    |
| Figtree Branch, R.L. and F.A.    | Figtree Hotel                     | A. Curtis                           | ..    | 2           | ..   |
| Gatooma                          | Gatooma                           | ..                                  | 18    | 16          | 20   |
| Gazaland                         | Court House, Chipinga             | W. Wood                             | 30    | ..          | ..   |
| Greystone                        | Rodeheuveel, Shangani             | J. W. Spencer                       | 11    | ..          | 13   |
| Hartley                          | Hartley                           | H. Savory                           | 11    | 9           | 6    |
| Headlands                        | Headlands                         | H. Barnes Pope                      | ..    | 30          | ..   |
| Insiza                           | Insiza Station Hotel              | N. C. St. J. Breslin                | 4     | ..          | ..   |
| Lalapanzi                        | Iron Mine Hill and Lalapanzi alt. | C. Allen                            | 17    | 15          | 19   |
| Loniagundi                       | Sinola                            | J. N. Bateman                       | ..    | 16          | ..   |
| Macheke                          | Macheke                           | H. H. Kidson                        | ..    | 2           | ..   |
| Makwiro                          | Makwiro                           | A. B. Fraser                        | ..    | ..          | ..   |
| Marandellas                      | Marandellas Farmers' Hall         | ..                                  | ..    | ..          | ..   |
| Mangwendi                        | Fixed every meeting               | E. P. de Kock                       | 4     | 2           | 6    |
| Makoni                           | Rusape                            | ..                                  | ..    | ..          | ..   |
| Marula                           | Marula Siding                     | J. A. Tapson                        | ..    | 2           | 6    |
| Mashonaland                      | Commercial Hotel, Salisbury       | MacW. Ingram                        | 25    | 23          | 27   |
| Matopo Branch, R.L. and F.A.     | Matundi Hotel                     | W. H. Williamson                    | 11    | 9           | 13   |
| Mazoe                            | Mazoe                             | W. Bathurst                         | 8     | ..          | ..   |
| Melsetter (North)                | ..                                | F. C. Peek                          | ..    | ..          | ..   |
| Midlands                         | Gwelo "Summerfield"               | Rev. R. Wodchouse & S. J. M. Marais | ..    | ..          | ..   |
| Northern                         | Farm "Summerfield"                | F. J. Ward                          | ..    | ..          | ..   |
| Northern Untali                  | Plumtree                          | R. O. H. Blurton                    | 4     | ..          | ..   |
| Que Que                          | Globe and Phoenix Hotel           | H. J. Brooke                        | 11    | 9           | 13   |
| Rhodesian Landowners and Farmers | Library Buildings, Bulawayo       | E. E. Somerset                      | 18    | 16          | 20   |
| Shanva                           | Shanva                            | H. S. Hopkins                       | 24    | 29          | 26   |
| Southern                         | Peggy Hotel, Insiza               | J. M. Moubay                        | ..    | dates fixed | 7    |
| Insiza                           | Selukwe Hotel                     | W. J. B. Harris                     | 5     | 3           | ..   |
| Setukwe                          | Fairview                          | F. S. Clark                         | ..    | dates fixed | ..   |
| Somabula and Shangani Flats      | ..                                | S. Annandale                        | ..    | ..          | ..   |
| Umvukwe                          | Christmas Pass Hotel              | Hon. J. S. Parker                   | ..    | dates fixed | ..   |
| Untali                           | Victoria                          | J. S. Holland                       | 4     | 2           | 6    |
| Victoria                         | Gwelo district                    | H. S. Hoatson                       | 29    | 20          | 17   |
| Vungu                            | ..                                | J. H. Erasmus                       | 7     | 14          | 11   |

## Departmental Notices.

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### Information for Farmers

The Department of Agriculture is prepared to furnish to farmers technical advice either by correspondence, or, where possible, by personal visits. All communications should be addressed in the first instance to the Director of Agriculture.

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### Crops

The Agricultural Branch deals with enquiries relating to agricultural practice, soils, crops, cultural operations, processes, seeds, trees, farm implements and machinery, etc.

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### Poisonous Plants

It is of great importance that as soon as possible a study should be made of those plants found in Southern Rhodesia which are poisonous or deleterious to small or large stock. Farmers and others who have known, or suspected poisonous plants on their property, are requested to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, at the same time forwarding specimens of the plant, including stem, leaves, flowers, and, where possible, fruit. Any particular regarding the habits of the plant will be welcomed, and in return the Department will supply all available information regarding the plants.

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### Disposal of Seeds

All farmers and others who have surplus supplies of good quality locally grown farm seed of any description are invited to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, stating what quantities are available for sale, and price f.o.r. nearest station. In all cases representative samples of the grain must accompany the letter, but need not exceed two ounces in weight.

The Agricultural Department is continually receiving enquiries as to where various seeds can be obtained, and it is



hoped that by the above means growers of reliable seed may be brought into touch with one another.

It must be clearly understood, however, that beyond recommending sources of supply, the Department cannot take any further part in the transaction.

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### **Tobacco**

The services of the Tobacco Expert are available to all desiring advice on the subject. Applications should be accompanied by particulars of the nature of the information sought, also the distance and direction of the farm from some well known centre.

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### **Live Stock**

The Animal Industry Branch is prepared to advise with regard to all matters connected with stock breeding, selection feeding and registration of stud animals, the dairy industry, poultry management, farm buildings for stock, and kindred subjects. Buyers and sellers of stud stock in Rhodesia are also put in touch with one another.

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### **Entomology**

The Government Entomologist advises on matters connected with insect pests of live stock, crops, and fruit trees, and also undertakes the inspection of nurseries and of the importation of plants from abroad.

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### **Chemical Analyses**

The Government Agricultural Chemist deals with matters relating to the composition of soils, fertilisers, farm produce of vegetable or animal origin; also the investigation of poisons and of articles of potential economic value.

Nominal charges are made, which, while not covering the cost, will help to defray the expense and serve as a proof of good faith. Samples, carriage prepaid, together with full particulars regarding the subject should be addressed to the Agricultural Chemist, Department of Agriculture, Salisbury.

A schedule of charges and directions for taking samples will be furnished on application.

With all analyses, reports will be furnished explanatory of the results and, when possible, advice given as to the nature, properties and value of the material.

No charge will be made for analysis where the material forwarded is considered by the Director of Agriculture and Chemist to be of sufficient general interest.

### Services of Government Veterinary Surgeons

1. The services of Government Veterinary Surgeons are available to the public, free of charge, for the following purposes only :—

- (1) Attending and giving professional advice in connection with the following diseases, viz. :—Anthrax, Contagious abortion, East Coast Fever, Epizootic Lymphangitis, Foot and Mouth Disease, Farcy, Foot-rot, Heartwater, Glanders, Intestinal parasites amongst sheep and goats, Liver Disease, Lungsickness, Osteo Porosis, Malarial Catarrhal Fever (blue tongue), Rabies, Redwater, Rinderpest, Scabies, Sponziecte (quarter evil), Swine Fever, and any other diseases which may in future be scheduled in terms of section 3, sub-section 18 of the "Animals Diseases Consolidation Ordinance, 1906." Attending to cases of disease amongst live stock which, though not of a contagious or infectious character, may be of general public importance.
- (2) Applying tests in regard to Glanders, Tuberculosis, or any other disease against the introduction or spread of which tests are applied under regulations.
- (3) Inoculations against the following diseases :—  
Horsesickness, Lungsickness, Anthrax, Quarter Evil, Redwater, Malarial Catarrhal Fever (blue tongue). A fee to cover the cost of serum and virus will be charged.

2. The following charges shall be made and payable for services rendered by the Government Veterinary Surgeons in other cases, viz. :—

|   | £ | s. | d. |
|---|---|----|----|
| (1) For every professional visit within three miles of his office or residence .... | 0 | 5  | 0  |

|  | £ | s. | d. |
|--|---|----|----|
| (2) For every professional visit beyond such distance ... .. plus an additional charge of 2/6 per hour whilst engaged in such visits or £2/2/0 a day of 24 hours ; | 0 | 10 | 6  |
| (3) For advice given at the Veterinary Surgeon's office, for each animal, per visit  | 0 | 2  | 6  |
| (4) The following to be charged in addition to visiting fees :—  |   |    |    |
| <i>a.</i> For every examination as to soundness, each ... ..   | 1 | 1  | 0  |
| <i>b.</i> For castration, horses, each ... ..  | 1 | 1  | 0  |
| <i>c.</i> For castration, bulls, each ....   | 0 | 5  | 0  |
| <i>d.</i> For castration, donkeys, each.. ...  | 0 | 10 | 6  |
| <i>e.</i> For parturition cases, mares, each   | 2 | 2  | 0  |
| <i>f.</i> For parturition cases, cows, each..  | 1 | 1  | 0  |
| <i>g.</i> For other operations, according to nature, from 5/- to £2/2/0.   |   |    |    |

3. Double the above fees will be payable for services rendered on Sundays, public holidays, and between the hours of 7 p.m. and 7 a.m.

4. Applicants for the services of Government Veterinary Surgeons must at their own cost provide the necessary transport for the conveyance of these officers from, and back to, their residence or nearest railway station.

5. Farmers and owners of stock throughout the country frequently telegraph for a Government Veterinary Surgeon to be sent to attend an animal which has been taken seriously ill. It is rarely possible to comply with these requests at once, as the Veterinary Surgeon may be engaged on duty which he cannot leave, or is at such a distance from where his services are required that he can hardly be expected to arrive in time to be of any service in an urgent case. Hence much valuable time is wasted, the owner of the animal is dissatisfied, and the veterinary staff discredited. To obviate this, in all cases where veterinary advice and assistance are required, the owner should telegraph to "Veteran," Salisbury, with prepaid reply, the nature of the complaint that the animal is suffering from, giving as full and accurate a description of the symptoms as possible. This will enable the Chief Veterinary Surgeon to



telegraph advice at once and state whether he is able to arrange for veterinary attendance on the case or not, and save valuable time, which is always of importance in acute cases.

6. The services of Government Veterinary Surgeons will only be available for private work with the consent of such officers, and when such work does not interfere with their official duties, or when the services of a private practitioner are not available.

7. As the arrangement of allowing Government Veterinary Surgeons to attend to private cases is intended purely for the benefit of farmers and stock-owners who may wish to obtain professional advice, no responsibility whatever will be accepted for any loss of stock, etc., which may result from the negligent treatment or advice, or wilful default, of any Government Veterinary Surgeon.

8. All fees collected in terms of these Regulations are payable to the Treasury through the local Receiver of Revenue.

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### Sale of Dip

With a view to enabling farmers to obtain dipping material at as low a rate as possible arrangements have been made whereby orders may be placed with any officer of the Veterinary Department for the purchase of supplies of Messrs. W. Cooper & Nephew's cattle dipping fluid, adapted for three-day, five-day or less frequent dipping. The price of the dip is 48s. 6d. per 10 gals., in not less quantities than that amount, delivered at any siding or station desired, in 5 gal. drums. Applications must be accompanied by remittances, without which they cannot receive attention. Remittances by cheque should be made in favour of Messrs. Meikle Bros., agents for the dipping fluid, commission being added, where necessary, to cover exchange. Coin or stamps will not be accepted. This dip is in use at all Government dipping tanks.

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### Sale of Virus

It is notified for public information that redwater and gall-sickness (*anaplasmosis*) virus may be obtained from the Veterinary Department, Salisbury, at a charge of ten shillings per dose.

Solutions of trypan blue and the injection used in the treatment of *trypanosomiasis* (fly disease) of cattle may also be

obtained at a charge of five shillings per dose and blue tongue virus at one shilling and sixpence per dozen doses.

No material will be issued unless a remittance accompanies the order.

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### Irrigation

From the Agricultural Engineer assistance may be obtained by farmers for the following :—

1. In the locating of possible irrigation projects.
2. In the preparation of surveys or plans and for irrigation works, including weirs, dams, furrows, pumping plants, and determining the extent of land which may be brought under irrigation schemes, together with rough estimates of costs.
3. In the supervision of construction and carrying out of projects.
4. In the selection of suitable sites for boring operations.
5. Preparing specifications, etc., regarding pumping plants, windmills, and agricultural machinery.
6. Giving general advice on cognate subjects.

Informal advice of a general character will be given to applicants making enquiry by letter or in person. Any applicant desiring professional assistance likely to occupy more than one day should apply for advice in writing. All applicants should specify clearly the nature of the project on which they seek advice, and should give full particulars as to the distance and direction of their farms from some well-known centre. Applicants will be required to provide suitable means of transport for the officer concerned during the period devoted to work on the spot; to provide any unskilled labour that may be required; and to provide for any other contingent services. Applications should be addressed to the Director of Agriculture, who will endeavour to arrange visits as far as possible in order of application, but with due regard to situation, in order to obviate unnecessary travelling and delay. The services of the Agricultural Engineer are given free, but in cases demanding prolonged individual attention, or repeated supervision, a charge may be made according to circumstances.

## Samples

In connection with enquiries, especially with regard to diseases amongst crops, insect pests, soils, grain and the identification of plants, specimens should, wherever possible, be sent, together with full details. It is found that such parcels are often forwarded without any indication of where they are from or why they were sent and it is difficult in such cases to trace the sender. It is, therefore, requested that persons when forwarding samples for examination, indicate clearly their names and address on the package, so as to enable their requirements to be attended to without delay.

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## Charges for Dipping Cattle at Government Dipping Tanks.

A charge of 1d. per head is made in respect of all cattle dipped at Government dipping tanks.

Unweaned calves will be dipped free of charge.

Payment may be made in cash or by means of books of coupons at £1, 10/- and 2/6, which can be obtained from Civil Commissioners, Native Commissioners, or through all Veterinary Surgeons and Cattle Inspectors.

The tanks to which these provisions at present apply are the following :—

Salisbury (3), Bulawayo (3), Inyati, Umtali, Penhalonga, Melsetter, Marandellas, Macheke, Mazoe, Lomagundi, Hartley, Gwelo, Selukwe, Enkeldoorn, Victoria, Gwanda, Gatooma, Que Que, Umvuma, Kimberley Reefs.

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## Lectures for Farmers

The services of certain of the officers of the Department of Agriculture and the Veterinary Department are available for purposes of delivering lectures on subjects upon which they have special knowledge. As far as practicable, lectures will be accompanied by demonstrations at the time or subsequently in the field. Owing to the many calls on the time of the staff and the exigencies of their duties, alternative dates are desirable in order to avoid disappointment. The following topics are



offered as examples of subjects that may be dealt with in this manner, but the suggestion of other themes is invited.

*Agriculture.*—Maize growing; Maize selection and maintenance of the breeding plot; Points of maize and maize judging, with demonstrations; Utilisation of granite vlei soils; Ground nut culture; Rotation crops for home use and for sale; Veld improvement by winter grasses; Production of foodstuffs for the mines; Ensilage; Fungoid diseases of maize and wheat; Wheat, oats and lucerne under irrigation; The prospects of cotton culture in Southern Rhodesia.

*Veterinary Hygiene.*—Detection and prevention of disease; The care of live stock.

*Live Stock.*—Judging of cattle according to breeds, and for beef, milk and draught; feeding and kraaling of live stock; general principles of cattle breeding; management of imported stock; grading up of native or local stock with pure bred bulls.

*Dairying.*—Home butter-making; building and equipment of a farm dairy; handling and marketing of milk; packing and marketing of butter; construction of cow houses.

*Swine Husbandry.*—Breeding and feeding of swine; some suggestions for the production of first-class bacon pigs; construction of piggeries at moderate cost.

*Chemistry.*—The principles of soil fertility; the principles of manuring; the value of lime in agriculture; chemistry of milk and its products (accompanied by demonstrations in milk-testing).

*Entomology.*—Economic entomology on the farm; the role of insects and their allies in the transmission of disease; scale insects and fruit trees and methods for their control; insect pests and maize; enemies of the potato, insect and fungus; the value and objects of plant import and nursery regulations.

*Irrigation.*—Methods of applying water to land for irrigation; the measurement of water in connection with irrigation; canal irrigation; storage reservoirs; hints on the selection of sites and on the design of earthen and other dams; irrigation by pumping, with notes on the selection of plants.

Enquiries and invitations should in the first instance be addressed to the Director of Agriculture, Salisbury.

### Forestry: Sale of Trees.

The under-mentioned varieties of trees are available for sale. The price is 8s. 4d. per 100 in tins of 25, f.o.r. Salisbury. A quantity of larger sized trees, four in a tin, will also be available at 1s. per tin. In some cases the supplies are limited.

Aloe bulbels and seed of *Dalbergia sissoo* can also be supplied.

Applications, together with cheque or money order, should be addressed to the Government Agriculturist and Botanist, Department of Agriculture, Salisbury.

|                              |                      |
|------------------------------|----------------------|
| <i>Albizzia lebbek</i>       |                      |
| <i>Casuarina leptoclada</i>  | = Beefwood           |
| <i>Cedrela toona</i>         | = Indian toona       |
| <i>Callitris calcarata</i>   | = Cypress pine       |
| " <i>robusta</i>             | = Murray pine        |
| <i>Cupressus arizonica</i>   | = Arizona cypress    |
| " <i>lusitanica</i>          | = Portuguese cypress |
| " <i>sempervirens</i>        | = Common cypress     |
| " <i>torulosa</i>            | = Himalayan cypress  |
| <i>Dalbergia sissoo</i>      |                      |
| <i>Eucalyptus amygdalina</i> | = Peppermint gum     |
| " <i>calophylla</i>          |                      |
| " <i>citriodora</i>          | = Lemon-scented gum  |
| " <i>longifolia</i>          |                      |
| " <i>paniculata</i>          | = Iron bark gum      |
| " <i>robusta</i>             | = Swamp mahogany     |
| " <i>rostrata</i>            | = Rostrata gum       |
| " <i>saligna</i>             | = Saligna gum        |
| " <i>tereticornis</i>        | = Red gum            |
| <i>Pinus densiflora</i>      |                      |
| " <i>halepensis</i>          | = Aleppo pine        |
| <i>Thuja orientalis</i>      | = Arbor vitæ         |
| " <i>gigantea</i>            |                      |

### Co-operative Experiments—Winter Cereal Crops

The free distribution of seed of winter cereal crops for trial under irrigation or on naturally moist land will commence about the end of February. The seed is issued free of charge on rail, Salisbury, and farmers taking part in the experiments are required to furnish, at the close of the growing season, on forms supplied for this purpose, an accurate and

complete report on the result of the experiments. In the event of any applicant who has received seed failing to comply with these conditions his name will be removed from the list of those eligible to receive co-operative seeds in the future.

It is anticipated that the under-mentioned varieties will be available for distribution, but since supplies of seed will be limited, early application is advisable, and no guarantee can be given that any particular variety asked for will be forthcoming. As far as possible, applications will be dealt with in the order in which they are received. Not more than three varieties of seed in all can be supplied to each applicant.

Wheat, Early Gluyas

|      |   |                      |
|------|---|----------------------|
|      | { | Algerian             |
|      |   | Garton's New Zealand |
| Oats |   | Texas                |
|      |   | Smyrna               |
|      |   | Sidonian             |

|        |   |            |
|--------|---|------------|
| Barley | { | Early Cape |
|        |   | Nepal      |

Early Rye

All applications to be addressed to the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, and full particulars to be given regarding the address to which it is desired seed should be consigned.

#### CITRUS CULTIVATION.

THE services of Mr. C. E. Farmer, Adviser on Citrus Cultivation to the British South Africa Company, are available. The British South Africa Company will be pleased to receive applications from farmers desirous of obtaining advice from Mr. C. E. Farmer on citrus cultivation, and to place his services at the disposal of the farming community, in so far as his duties permit. Applications, which will be dealt with in order of date, should be addressed to the Director of Land Settlement, Salisbury. No fee will be charged for Mr. Farmer's services.



## Departmental Bulletins

The following Bulletins, consisting of reprints of articles which have appeared in this Journal, are available for distribution free of charge to applicants in Rhodesia :—

### AGRICULTURE.

- No. 2. The Possibilities of Rhodesia as a Citrus Growing Country, by R. McIlwaine, M.A., LL.B.
- No. 61. Requirements in sending Botanical Specimens to the Department for Identification.
- No. 62. Services of Agricultural Engineer.
- No. 64. Hints on Irrigation—Small Gravitation Schemes, by W. M. Watt.
- No. 81. Possibilities of Export Trade in Oil Seeds, by H. Godfrey Mundy, F.L.S.
- No. 90. Reports on Experiments—Experimental Station, Salisbury, 1910-1911, by J. H. Hampton.
- No. 94. Second Report on Experiments, by J. H. Hampton.
- No. 125. Subterranean Water, by W. M. Watt.
- No. 137. Drainage for Irrigated and Swampy Land, by W. M. Watt.
- No. 143. Hints on Planting an Orange or Lemon Grove, by Chas. E. Farmer, Citrus Adviser to the British South Africa Company.
- No. 153. Citrus Fruit Trees—From Seed to Grove.
- No. 155. The Manuring of Maize on the Government Experimental Farm, Gwebi, 1912-13.
- No. 156. Elephant Grass or Napier's Fodder, by J. A. T. Walters, B.A.
- No. 160. Hints on Irrigation—Pumping Plants, by W. M. Watt, Agricultural Engineer.
- No. 164. Citrus Fruits in Rhodesia—Suggestions as to where to Plant, by C. E. Farmer.
- No. 166. Rhodesian Citrus Fruits—Exportation to London.
- No. —. Orange and Lemon Growing in Southern Rhodesia, by R. McIlwaine.
- Tree Culture in Southern Rhodesia, by P. B. S. Wrey, A.M.I.C.E.

### CROPS.

- No. 88. Chicory Growing, by H. Godfrey Mundy, F.L.S.
- No. 93. Soy Beans, by R. H. B. Dickson.
- No. 106. Cultivation and Preparation of Ginger.
- No. 107. The Cowpea, by R. H. B. Dickson.
- No. 126. Turkish Tobacco.
- No. 128. Paspalum, by J. A. T. Walters, B.A., Assistant Agriculturist and Botanist.
- No. 132. Sumatra Tobacco, Hints to Rhodesian Growers, by C. J. Sketchley.
- No. 133. Tobacco Culture (Virginia)—Planting, Cultivation, Fertilising, Priming, Topping, Suckering, Ripening.
- No. 138. Tobacco Culture (Virginia)—Harvesting and Curing.

- No. 162. Rhodesian Maize: The Principal Types and their Points, by J. A. T. Walters, B.A., Assistant Agriculturist.
- No. 170. Production of Pedigree Seed—Maize, by H. Godfrey Mundy, F.L.S.

## ENTOMOLOGY AND VEGETABLE PATHOLOGY.

- No. 46. The Head Smut of Maize, by H. Godfrey Mundy, F.L.S.
- No. 58. Onion Thrips, by R. W. Jack, F.E.S.
- No. 66. Selection of Spraying Outfit, by R. W. Jack, F.E.S.
- No. 69. Resin Wash and Means of Applying It, by R. W. Jack, F.E.S.
- No. 75. Fumigation of Fruit Trees with Hydrocyanic Acid Gas, by R. W. Jack, F.E.S.
- No. 100. Tsetse—Preliminary Notes on the Habits of—by R. W. Jack, F.E.S.
- No. 120. Some Insect Pests of Maize, by R. W. Jack, F.E.S.
- No. 140. Insect Pests of Tobacco in Southern Rhodesia, by R. W. Jack, F.E.S.
- No. 142. The Bean Stem Maggot, by R. W. Jack, F.E.S.
- No. 147. Root Gallworm, by R. W. Jack, F.E.S.
- No. 148. Darkling Beetle Grubs Injurious to Tobacco, by R. W. Jack, F.E.S.
- No. 151. Potato Spraying Experiments for the Control of Early Blight, by Rupert W. Jack, F.E.S.
- No. 154. Borers in Native Timber—Results of Experiments with Preservatives, by Rupert W. Jack, F.E.S.
- No. 158. Two Ladybirds Injurious to Potato Plants, by R. W. Jack, F.E.S.
- No. 171. The Cabbage Web-Worm—A Pest of Cabbage and Allied Plants, by R. W. Jack, F.E.S.
- No. 172. Diseases of the Potato Tuber and the Selection of Sound Seed, by R. W. Jack, F.E.S.

## VETERINARY.

- No. 50. Epizootic Abortion in Cattle, by Ll. E. W. Bevan, M.R.C.V.S.
- No. 51. Strangles, by F. D. Ferguson, M.R.C.V.S.
- No. 53. Animals Diseases Consolidation Ordinance, 1904.
- No. 74. The Detection and Prevention of the Diseases of Stock in Rhodesia, by Ll. E. W. Bevan, M.R.C.V.S.
- No. 77. Animals Diseases Amending Ordinance, 1911.
- No. 80. Detection and Prevention of Diseases of Stock, by Ll. E. W. Bevan, M.R.C.V.S.
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- Conditions under which Government Veterinary Surgeons' Services are available to the public.

## LIVE STOCK.

- No. 10. Watering and Feeding of Live Stock on Railway.  
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 No. 161. Notes on Cattle Breeding, Part III., by R. C. Simmons.  
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 No. 167. The Construction of Dipping Tanks for Cattle.  
 No. 169. The Breeding and Feeding of Pigs for Bacon Factory Purposes, by R. C. Simmons.

## MISCELLANEOUS.

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 Game Law : Summary of.  
 Terms for Analysis by the Department of Agriculture, of Produce, Soils, Water, etc.

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**HANDBOOK OF TOBACCO CULTURE** for  
 Planters in Southern Rhodesia. Sold by the Department of Agriculture. 2/6.



## Employment on Farms.

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The Department of Agriculture receives numerous enquiries from persons of varied attainments, age and financial position for openings on farms, as managers, assistants and learners, requiring remuneration on corresponding scales, or willing to give services in return for keep.

In order that work may be found for the above and needs of farmers met, applications are invited from both employers and persons seeking employment. Applications are also invited from artisans, such as masons, bricklayers, carpenters, fencers, well sinkers, concrete workers, and the like who may desire work on farms. In cases where employers have obtained the labour they require, or applicants for employment have found work, it is requested that notification be at once sent to the Department of Agriculture, in order that unnecessary correspondence be avoided.

Replies to the following applications should be addressed to the initials of the advertisers, c/o Director of Agriculture, who will forward the letter to the party referred to.

---

### SITUATIONS VACANT.

J. M. G.—Wanted man with small capital to farm on shares maize lands, extensive and good.

D. S. M.—Learner required for tobacco curing season. Board, lodging and small salary.

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### SITUATIONS WANTED.

J. F. T.—Farm assistant; general farming and tobacco; moderate salary.

P. T.—As farm manager. Twenty years' Natal and Rhodesian experience; cattle, mixed agriculture and tobacco.

F. J. G.—As manager or assistant. Thorough knowledge of stock and general farming.

J. H. G.—As farm manager. Eleven years' Rhodesian experience, including general farming and cattle.

W. D. W.—Twenty-four; wishes experience on mixed farm (cattle a feature). Royal Agricultural College, Cirencester, Gloucestershire, 1907-1910. Some experience of sugar-cane and cattle in Mexico, 1910-1913. Willing to work for small wage with board and lodging.

A. F.—Hungarian, single, aged 29; carpenter by trade, can also build with stone and brick. Speaks English, German, Dutch and Sindebele fluently, also understands general farming. Requires situation on a large estate, such as care, erection and keeping in repair buildings, etc., or management of mixed farm stock. Will go anywhere Northern or Southern Rhodesia.

K. D. H.—Experience on big ranch with native and thoroughbred cattle and sheep; also tobacco and general farming. Understands horses well. Position wanted with fair salary.

H. E. X.—By young man on cattle farm as learner; three months for board and lodging, afterwards salary by agreement.

H. C. T.—General farming, as manager or assistant, brought up on farm. Two years' training Elsenberg Agricultural College. Knowledge of native language. First-class references.

H. B.—Energetic man, married; general farm work, agriculture, dairying and poultry; capable steam tractor driver and fitter; also pump work and well-sinking.

F. G. H.—Requires situation during tobacco curing on farm. Thoroughly understands oxen and general farming. £8 10s. and board to start.

Roderick S. Marshall, Barrow-on-Humber, Hull, England.—Scotch, 20 years of age. Has had experience in dairying (Ayrshires), also in beef-raising, sheep, pigs, horses and general agriculture. Would work for board and lodging the first year.

## Government Notices.

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[No. 50 of 1912.]

[8th February, 1912.]

### AFRICAN COAST FEVER.

*Regulations regarding the movement of cattle and the prevention and suppression of disease.*

1. UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw Government Notices Nos. 329 of 1910 and 308 of 1911 and make the following provisions in lieu thereof :—

2. The various districts of Southern Rhodesia are hereby declared an area infected with African Coast Fever for the purposes of section 5 (2) of the aforesaid Ordinance, and, save as hereinafter set out, all movement of cattle within the said districts is prohibited until further notice.

#### *General Movement.*

3. For the purpose of section 22 (1) of the said Ordinance, the following shall be regarded as places within the boundaries of which the movement of cattle may be allowed without special permission :—

- (a) Single farm.
- (b) Two or more adjoining farms, farmed together under one management and situated within one cattle transport area.
- (c) An area, the property of one owner, enclosed by a substantial fence.
- (d) For grazing purposes, an area within a radius of four miles of native kraals situated on unalienated land or in reserves, save and in so far as such area includes any private land.

The sites of such kraals shall be deemed to be the places where they are situated at the date of promulgation of these regulations.

4. Notwithstanding the provisions of the last preceding section, or of section 9 hereof, the Chief Inspector may, on the outbreak of disease, or for such other cause as may be deemed expedient, direct the isolation or quarantine of cattle on a limited area of the aforesaid places.

5. The movement of cattle from place to place may be permitted under the special permission, in writing, of an Inspector, Sub-Inspector, or other officer or person duly authorised by the Administrator to grant such permission.

6. No permission as aforesaid shall permit the movement of cattle—

- (a) Without the written consent of the owners, occupiers or managers of occupied land, and in the case of native reserves, of the Native Commissioner of the district over which land or reserve such cattle will pass, whether along roads or otherwise; provided, however, that refusal to grant such consent shall be in writing, and provided further that if the Controller of Stock or the Chief Inspector shall consider that such consent is withheld without good and sufficient cause he may permit of movement without such consent.



If any such person mentioned above refuse to give consent or to state a reason for refusing to do so in writing, no valid objection shall be deemed to exist and movement may be permitted without such written consent.

- (b) Within a veterinary district as defined in the Schedule annexed hereto from one transport area to or through another without the consent of the Cattle Inspector in charge of such area.
- (c) From any veterinary district to or through another without the consent of the District Veterinary Surgeon of such district.

#### *Slaughter Cattle.*

7. Cattle moved to any centre for slaughter under the provisions of these or any other regulations shall, on arrival, be immediately taken to such quarantine area (if any) as is provided for the purpose and immediately branded with the letters "V.D." on the near hip.

8. Cattle admitted to a quarantine area in terms of the last preceding section shall be slaughtered within twenty-one days of the date of admission, and shall not be permitted to leave the same except for the purpose of being slaughtered at the appointed abattoir, and if found outside such area, except for the said purpose, may be destroyed on the order of the Chief Inspector or Controller of Stock; provided, however, that the Chief Inspector may allow the removal of cattle from such an area under such conditions as he may prescribe.

#### *Transport Cattle.*

9. The use of cattle for draught purposes is prohibited except :—

- (1) Within the boundaries of the places defined in section 3 (a), (b) and (c) hereof.
- (2) Within the boundaries of areas already fixed for the use of cattle for draught purposes in terms of regulations published under Government Notice No. 329 of 1910, or such other areas as may be fixed by the Administrator.

10. Notwithstanding the provisions of section 9, no permit shall authorise the working of cattle

- (a) which are not clearly and distinctly branded with the registered brand of the owner;
- (b) in any wagon or vehicle which shall not have the owner's name and address legibly and permanently inscribed on the right side thereof.

11. No wagon or other vehicle drawn by oxen shall be moved from one cattle transport area into another without the permission of the Cattle Inspectors concerned, and under such conditions as they may impose.

#### *General Provisions.*

12. On the outbreak or suspected outbreak of disease, the Administrator may declare an area of infection around and embracing the place of outbreak or suspected outbreak, and a further area or areas around such area of infection as a guard area, whereupon all movement of cattle into and from place to place within such area or areas shall be immediately suspended, except as hereinafter provided.

A.—*In areas of infection and guard areas :—*

- (1) Cattle in transit by rail may be moved through such area.
- (2) Cattle from beyond the borders of Southern Rhodesia may be detained within such area or areas *en route* to destination.
- (3) Cattle for *bona fide* farming, dairy and slaughter purposes may be moved into such area or areas by permission of the Chief Inspector and under such conditions as he may impose.

*B.—In guard areas only:—*

Cattle may be moved into and from place to place within such area under the conditions of section 6 hereof.

13. The removal of green forage, hay, fodder, bedding reeds, manure or of such other articles as may be reasonably supposed capable of conveying infection, shall be prohibited from areas of infection, save and except with the special permission of the Administrator.

14. Whenever an area shall have been declared under section 12 hereof, every person within such area, or within such further area as may be specified by Government Notice, owning or in charge of cattle shall, upon the death or slaughter because of disease, suspected disease, or accident, of any such cattle, immediately report such occurrence through the nearest Cattle Inspector, Native Commissioner or Police Officer to the District Veterinary Surgeon.

15. Notwithstanding the provisions of these regulations, it shall be competent for the Chief Inspector of Cattle to authorise and direct the movement of cattle for the purposes of isolating, dipping, quarantine, or any other such objects as may be deemed necessary to prevent or suppress an outbreak of disease.

16. Whenever an area shall have been declared an area of infection or guard area in terms of section 12 hereof, any person who shall allow any cattle to stray or be otherwise removed, except as provided for in these regulations, from any one place within such area to another place, or from a place outside of to a place within such area, shall be guilty of an offence against these regulations.

17. All cattle within the limits of the various commonages and townlands, areas of infection and guard areas as declared under section 12 hereof, or depastured on common grazing ground, shall be dipped or sprayed at least once in every three days, unless the Chief Inspector shall authorise the extension of the time between such dipping or spraying, or the entire suspension of the same.

18. In all areas of infection and guard areas sheep and goats shall be dipped at such periods as may be directed by the Chief Inspector.

19. Whenever the owner, occupier, or manager of a farm shall adopt means of cleansing cattle running thereon, either by spraying, dipping, or by any other method, the Chief Inspector may order any natives or other persons having cattle on the same farm to cleanse such cattle, and the Native Commissioner of the district within which the farm is situated may enter into an arrangement with the native owners of cattle to cleanse such cattle at a charge to be mutually agreed upon between the said owner, occupier or manager and the said native owners.

20. All permits for the removal of cattle issued under the provisions of the said Ordinance or of any regulations framed thereunder shall specify legibly and clearly on the face thereof the place from and to which such cattle may be removed, the route by which they shall travel, the number and brands of such cattle, the time allowed for the journey, and such other particulars and conditions as it may be deemed expedient to provide.

21. No permit issued for the movement of cattle shall be taken to authorise any trespass in connection with such movement.

22. Notwithstanding the provisions of these regulations, it shall not be lawful for any owner of cattle to allow any such cattle to be on any road, public outspan, commonage, or any property other than that of the owner, unless they are free from ticks or unless they have been effectively cleansed by dipping, spraying or other process, within fourteen days of being allowed on such road or other place. Any beast having ten or more ticks on it shall not be considered free from ticks.



23. Any person contravening the provisions of these regulations or the conditions set out in permits issued thereunder, shall, where no higher penalty has been by the said Ordinance or any other law provided, be liable in respect of each offence to a fine not exceeding £20, or in default of payment to imprisonment with or without hard labour for a period not exceeding three months.

### SCHEDULE "A."

#### VETERINARY DISTRICTS OF SOUTHERN RHODESIA.

##### (1) *Salisbury.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912 :—

32. Battlefields; 33. Hartley and Gatooma; 34. Gadzema Station; 35. Makwiro Station; 36. Norton Siding; 37. Hunyani Tank; 38. 1645½ Peg B. & M. & R. Railways; 39. Salisbury A.; 40. Salisbury B.; 41. Salisbury C.; 42. Salisbury D.; 43. Arcturus; 44. Bromley; 45. Marandellas North; 46. Marandellas South; 48. Headlands Station; 49. Junction Mazoe and Lomagundi Railways; 50. 23-Mile Peg, Lomagundi Railway; 51. Passaford Station; 52. 35-Mile Peg, Lomagundi Railway; 53. Gwibi Tank Halt; 54. Banket, Lomagundi; 55. Eldorado, Lomagundi; 56. Selby Siding; 57. Mazoe; and 58. Kimberley Reefs.

##### (2) *Bulawayo.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912 :—

1. Plumtree; 2. Marula Siding; 3. Figtree; 4. Westacre Junction; 5. Bulawayo Area; 6. Heaney Junction; 7. Bembesi Station; 8. Insiza North; 9. Insiza South; 10. Shangani North; 11. Shangani South; 14. Redbank; 15. Nyamandhlovu Station; 16. Malindi Station; 17. Wankies Area; 18. Matetsi Siding; 19. Matopo Terminus; 20. Sabiwa Siding; 21. Gwanda Station; 22. West Nicholson; 23. Belingwe; 29. Essexvale and Balla Balla Areas; 60. Stanmore Siding Area; 61. Filabusi Area.

##### (3) *Gwelo.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912 :—

12. Somabula Siding; 13. Gwelo Station; 24. Selukwe Area; 25. Surprise Area; 26. Indiva Siding; 27. Lalapanzi; 28. Iron Mine Hill Siding; 29. Umvuma Siding; 31. Que Que Station.

##### (4) *Umtali.*

An area comprising the native districts of Umtali, Melsetter, Makoni and Inyanga.

No. 24 of 1914.]

[14th January, 1914.

### AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Government Notices Nos. 82, 129, 143, 258, 297 and 326 of 1913, and, in terms of section 12 of Government Notice No. 50 of 1912, declare the following areas of infection and guard areas :—



## (1) NATIVE DISTRICT OF MATOBO.

(a) *Area of Infection.*

The farms Collaton and Irene and the Mabogutwani Outspan.

## (2) NATIVE DISTRICT OF SALISBURY.

(a) *Areas of Infection.*

- (1) The farm Haydon.
- (2) Hatfield Estate and Hatfield Estate Plots.
- (3) Salisbury Commonage.

(b) *Guard Areas.*

(1) The farms Stamford, Homefield, Kinvarra, Mount Hampden, Mount Hampden Reserve and Good Hope.

(2) The farms Warren, Lochinvar, Willowvale, Makabusi Outspan, Ardbennie Township, Waterfall, Hopley, Saturday Retreat, Odar Outspan, Stoneridge, Spreckley, Eyrecourt, Eyerston, Retreat, Prospect, Bunkers Hill, Adair, Boutelle, Godavery, Twentydales, Deanesbrook, Glenwood, Adelaide, Epworth, Ventersburg, Lorelei, Makabusi, Gallagher's, M.T.C. and the Letombo Reserve.

## (3) NATIVE DISTRICT OF UMTALI.

(a) *Areas of Infection.*

(1) The farms Inodzi, Nyagari, Mountain Home (The B.), Umtali Mission and the Penhalonga Valley.

(2) The farm Mabondā.

(b) *Guard Area.*

That portion of the native district of Umtali bounded on the south by a line running from the Odzi River along the south-western boundaries of the farms Odzi Junction, Grange, and Premier Estate, the western and southern boundaries of Wiermouth and the southern boundaries of Devonshire and Umtali Commonage.

## AFRICAN COAST FEVER.

Government Notice No. 76 of 26th February, 1914, published in *Government Gazette* dated 27th February, 1914, amends the following areas in which the use of cattle for draught purposes may be permitted under the conditions of the regulations governing the movement of cattle:—

Plumtree, Marula Siding, Figtree, Westacre Junction, Bulawayo area, Heany Junction, Bembesi Station, Insiza North, Insiza South, Shangani North, Shangani South, Belingwe area, Redbank, Nyamandhlovu Station, Gwaai Station, Malindi, Wankie, Matetsi, Matopo Terminus, Essexvale, Balla Balla and Filabusi, Stanmore Siding, Gwanda, West Nicholson, Gwelo, Selukwe, Umvuma, Iron Mine Hill, Lalapanzi, Hunter's Road, Que Que, Hartley, Gatooma and Battlefields, Gadzema Station, Makwiro, Norton Siding, Gwebi Tank Halt, Lomagundi, Mazoe, Bindura.

No. 369 of 1913.]

[11th December, 1913.

## IMPORTATION AND USE OF VIRUS, VACCINE, ETC.

UNDER and by virtue of the powers vested in me by section 5, subsection (6) (e), of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby provide as follows:—

(1) No person, firm or corporation shall manufacture, import, sell, barter or exchange any virus, vaccine, serum or analogous product used for the diagnosis or treatment of diseases of animals without the permission in writing of the Chief Inspector.

(2) No person shall use any virus, vaccine, serum, blood, bile or analogous product for the diagnosis or treatment of animals without the permission in writing of the Chief Inspector.

(3) Any person desiring to import, manufacture, sell, barter or exchange or to use any of the above-mentioned substances or products shall apply to the Chief Inspector for his requisite permission, which may be refused or granted under such conditions as the Chief Inspector may impose.

(4) Any person contravening any of the above regulations or failing to observe the conditions attached to any permit issued in terms of the last preceding sub-section shall be liable on conviction to a fine not exceeding £20, or in default of payment of any fine inflicted to imprisonment with or without hard labour for a period not exceeding three months.

No. 128 of 1914.]

[19th March, 1914.]

#### IMPORTATION OF CATTLE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel the regulations published under Government Notices Nos. 110 of 1908, 96 of 1909, 47 of 1912 and 60 of 1913, and make the following provisions in lieu thereof:—

1. The importation of cattle will be permitted from the Cape Province, the Orange Free State and the Transvaal on the following terms and conditions:—

- (1) A permit shall be required from the Chief Inspector, which may contain such conditions as shall from time to time appear expedient.
- (2) The importation of cattle with more than two permanent central incisor teeth shall not be permitted, except that animals entered in the South African Stud Book or the appendix thereto, with not more than the first and second pairs of permanent incisors, may be imported.
- (3) Applications for permission to import shall be in the form "A" attached hereto, and accompanied by a declaration in the annexed form "B."
- (4) All importations shall be by rail, and for the purposes of importation, Bulawayo shall be the port of entry.
- (5) All cattle imported in terms of these regulations shall, on arrival at Bulawayo, Salisbury or Umtali, be submitted to such examination or tests as the Chief Inspector may direct. If such examination or tests disclose the existence of any destructive disease, the cattle shall be immediately destroyed and the carcasses thereof disposed of in such a manner as a Government Veterinary Surgeon may authorise or require. The Chief Inspector may permit of the age restriction and the tests aforesaid being dispensed with in the case of cattle in transit by rail to any place beyond the borders of Southern Rhodesia.

- (6) All expenses or losses incident to quarantine, examination, testing or destruction as aforesaid shall be borne by the owner of the cattle.

2. The importation of cattle from the United Kingdom of Great Britain and Ireland, the United States of America, the Kingdom of the Netherlands and Germany will be permitted under the following terms and conditions :—

- (1) Importation shall be through and direct from the ports of Cape Town or Port Elizabeth, and there shall be a consignment note or other satisfactory evidence that cattle so imported have come direct from one of the above-mentioned countries.
- (2) The provisions of sub-sections (5) and (6) of section 1 hereof shall apply to importations in terms of this section.

3. Any person introducing cattle in contravention of these Regulations, or failing to comply with any of the conditions attached to permits to import, or furnishing applications, declarations, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, testing, destruction or disposal of carcasses, shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties shall have been provided for such offences by the "Animals Diseases Consolidation Ordinance, 1904"; provided, however, that the penalties imposed by these Regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

#### ANNEXURE "A."

##### APPLICATION FOR CATTLE IMPORTATION PERMIT.

1. Applicant's Name and Address.....
2. Number and Class of Cattle to be imported.....
3. Area or Farm and District where Cattle are at present located.....
4. Area or Farm and District to which Cattle are to be moved.....

Applicant's Signature.....

Date.....

Application.....

Permit No.....

#### ANNEXURE "B."

I, ..... residing on the farm ..... in the district of ..... do solemnly and sincerely declare that the ..... (number in writing) animals also enumerated below have been in my possession since birth, and that Lung sickness (Contagious Pleuro-Pneumonia) has not existed amongst any of my cattle, nor on my farm, during the last four years, and that these animals have never been exposed for sale in any public market or stock fair.



Number of Animals ..... Bulls ..... Heifers .....  
 Breed .....  
 Seller's Name and Address .....  
 Purchaser's Name .....  
 Place in Southern Rhodesia to which animals are being sent  
 .....  
 And I make this solemn declaration conscientiously believing the same  
 to be true.  
 .....  
 Declared to at ..... on this ..... day of.....  
 before me,  
 .....  
 Resident Magistrate for the District of .....

No. 127 of 1910.]

[2nd June, 1910.

#### IMPORTATION OF CATTLE FROM NORTH-EASTERN RHODESIA.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that the importation of cattle from North-Eastern Rhodesia may be permitted under the following terms and conditions:—

1. The permission of the Chief Inspector of Cattle be first had and obtained.

2. All cattle shall be introduced by way of the town or port of Feira, which is hereby declared a port of entry.

3. All applications for permission to import shall be accompanied by—

(1) A certificate by a Government Veterinary Surgeon of the territory of origin that—

a. the districts from which they come and through which they pass are free from contagious diseases of animals;

b. the animals in respect of which the application is being made have been examined and are free from any destructive disease.

4. All cattle shall on entry be taken to a quarantine area defined by the Chief Inspector of Cattle, and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, not less than three months.

5. Cattle at Feira at the date of promulgation of this notice may be removed to the quarantine area on permission of the Chief Inspector of Cattle without the certificates detailed above.

6. Any person found introducing cattle in contravention of these regulations, or failing to comply with any of the conditions attached to permits to import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties have been provided for such offence by the "Animals Diseases Consolidation Ordinance, 1904"; provided, however, that the penalties imposed by these regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

## SCHEDULE "A."

## 1. CERTIFICATE UNDER SECTION 3. (1), a.—

I hereby certify that I have examined the following cattle belonging to  
Mr. ....

..... Cows and heifers,  
..... Calves,  
..... Oxen and bulls,

and that the districts from which they come and through which they will pass in this territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signature .....  
Government Veterinary Surgeon.

## 2. CERTIFICATE UNDER SECTION 3. (1), b.—

I hereby certify that I have examined the following cattle belonging to  
Mr. ....

..... Cows and heifers,  
..... Calves,  
..... Oxen and bulls,

In my opinion these animals are free from all destructive diseases.

Signature .....  
Government Veterinary Surgeon.

No. 211 of 1910.]

[4th August, 1910.

## IMPORTATION OF CATTLE FROM NORTH-WESTERN RHODESIA.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that, notwithstanding the prohibition contained in Government Notice No. 89 of 1908, the importation of cattle from North-Western Rhodesia may be permitted under the following terms and conditions:—

1. The permission of the Chief Inspector of Cattle shall be first had and obtained.

2. All cattle shall be introduced (a) by rail via the Victoria Falls, or (b) by way of the town or port of Feira, which are hereby declared to be ports of entry.

3. All applications for permission to import shall be accompanied by a certificate by a Government Veterinary Surgeon of North-Western Rhodesia that—

- (a) the districts from which they come and through which they pass are free from contagious diseases of animals;
- (b) the animals in respect of which the application is being made have been examined and are free from contagious diseases of animals.

4. All cattle shall on entry be taken, where possible by rail, to such quarantine area and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, but not less than three months.

5. Any person found introducing cattle in contravention of these regulations, or failing to comply with any of the conditions attached to permits to import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all

lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months; provided, however, that the penalties imposed by these regulations shall not exempt from liability to penalties, forfeiture, or destruction, elsewhere provided for

### ANNEXURE "A."

#### *Certificates under Section 3.*

(a) I hereby certify that I have examined the following cattle belonging to Mr. ....

.....cows and heifers,

.....calves,

.....oxen and bulls,

and that the districts from which they come and through which they will pass in this Territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signed.....

Government Veterinary Surgeon.

(b) I hereby certify that I have examined the following animals belonging to Mr. ....

.....cows and heifers,

.....calves,

.....oxen and bulls.

In my opinion these animals are free from all destructive diseases.

Signed.....

Government Veterinary Surgeon.

NOTE.—All numbers are to be expressed in words.

### IMPORTATION OF STOCK FROM THE PROVINCE OF THE CAPE OF GOOD HOPE.

WITH reference to Departmental Notice of 28th February, 1912, it is hereby notified that the said Notice is cancelled, and importation of stock will now be permitted, in terms of Government Notice No. 110 of 1908, from the Province of the Cape of Good Hope, with the exception of the following districts :—

Komgha  
East London

Peddie  
Victoria East  
Kingwilliamstown  
Stutterheim  
Cathcart

Stockenstroom  
Queenstown (Gwatyu Ward  
only)  
Glen Grey  
Maclear  
Elliot Slang River  
Wodehouse  
Barkly East



No. 375 of 1912.]

[28th November, 1912.]

## IMPORTATION OF POULTRY.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," as amended by the "Animals Diseases Amendment Ordinance, 1910," I do hereby declare and make known that the following regulations shall be in force and effect from date of publication hereof :—

(1) All poultry imported by rail shall be inspected by an Inspector or Sub-Inspector at Plumtree, Bulawayo or Umtali.

(2) Should any consignment of poultry shew symptoms of disease, or should such Inspector or Sub-Inspector have reason to believe that any disease exists in, or that infection is likely to be conveyed by such consignment, he may order the detention and isolation of the whole consignment for such period as he may deem necessary.

(3) The Chief Inspector may order the destruction of all poultry which he has reasonable grounds for believing to be diseased or likely to convey infection.

THE following extract from Live Stock Regulations, printed on page 150 of the South African Railways Official Tariff Book, is published for general guidance :—

Poultry are not accepted by rail unless they are placed in a crate and the following conditions are complied with :—

(1) The size of the crate shall be 3 feet 6 inches by 2 feet 9 inches external floor dimensions; for turkeys and geese the height shall be 30 inches; and for fowls, ducks, and poultry of a like size, the height shall be 20 inches.

(2) Each crate must contain two drinking vessels filled with pure water, such vessels to be not less than five inches in depth, of the unspillable type, one being fixed at opposite corners of the coop.

(3) Each crate shall contain two receptacles for food of a suitable size, filled with suitable food other than whole maize.

(4) The birds must not be over-crowded in the crates, and in no case must there be more than 20 fowls, ducks or other birds of a like size, or ten turkeys or geese.

(5) Different species of birds must not be placed in the same coop.

Unless coops, crates, and the like are strong enough to bear ordinary transit handling, the Administration will not accept responsibility for loss.

No. 336 of 1911.]

[26th October, 1911.]

## RABIES.

THE following instructions regarding the treatment of persons bitten by rabid animals are published for general information.

In every case where a person has been bitten by a dog or other animal known or suspected to be rabid, the following precautions are recommended :—

(1) The wound should be immediately and thoroughly cauterised. This, if it does not altogether prevent the disease, delays its onset sufficiently for Pasteur treatment to be successfully applied.

(2) The patient should be sent to Salisbury for treatment at once. Delays are dangerous.

(3) The fullest information should be sent to the Health Department as to date when bitten, locality, fate of dog, and especially reasons for supposing the dog to be mad.

## SUMMARY OF THE "GAME LAW CONSOLIDATION ORDINANCE, 1906," AND REGULATIONS ISSUED THEREUNDER.

The Ordinance divides the game into three distinct classes, described as follows :—

- (a) Birds and Small Buck.
- (b) Bushbuck, Hartebeest, Impala, Lechwe, Pookoo, Roan and Sable Antelope, Sitatunga, Tsessebe, Waterbuck, and Wildebeest.
- (c) Royal Game, which includes Eland, Elephant, Giraffe, Gemsbok, Hippopotamus, Inyala, Koodoo, Ostrich, Rhinoceros, Springbuck and Zebra.

The shooting season for Class "A" is as follows :—

In Mashonaland :

Birds from 1st May to 30th September.

Small Buck from 1st May to 31st October.

In Matabeleland :

Birds and Small Buck from 1st May to 31st October.

To shoot in Class "A" a licence costing £1 per annum is required. This entitles holders to hunt in both Provinces during the open season.

Class "B."—The season opens on 1st July and closes on 30th November in both Provinces. The licence fee is £25 for non-residents and £5 for persons having their domicile in Southern Rhodesia. This licence entitles the holder to shoot up to 15 head, which number may be increased to a total of 25 upon payment of a further sum of £15 in the one case and £5 in the other.

Class "C."—The Administrator may, if he is satisfied that the animals are actually required for scientific purposes, grant to the holder of a game licence permission to shoot or capture any of the species included in this Class. Such permit requires a £5 stamp. Applications in writing, together with proof of *bona-fides*, should be addressed to the Director of Agriculture.

Game for Farming Purposes.—Permits may be granted for the capture of Eland, Ostrich, Zebra or other animals for the purposes of breeding or farming. Such permits require a stamp of the value of £1 and remain in force for six months. Application, accompanied by a sworn declaration, should be made through the Director of Agriculture or the Civil Commissioner of the district.

Game Injuring Crops.—The occupier of any cultivated land or any person acting under the authority of such occupier, may at any time destroy game actually doing damage on such land.

Elephants on Occupied Farms, Melsetter.—The destruction of Elephants when found on occupied farms on the High Veld in Melsetter District is authorised (*vide* Government Notice No. 284 of 1908).

Tsetse Fly Areas.—Government Notices Nos. 201, 207 and 321 of 1913 and 98 of 1914 suspend the close season for all classes of game, with the exception of ostriches and other birds classified as game, within the following areas in the Hartley district and the Sebungwe district for a period of one year from 1st July, 1913, and Lomagundi district for one year from 1st November, 1913 :—

Hartley District.—From the railway bridge on the Umfuli River, thence north-westwards along the Umfuli River to where it joins the Umniati River, thence southwards along the Umniati River to where it joins the Umsweswe River, thence eastwards along the Umsweswe River up to the drift at the Lydia Mine, thence along the old road from Lydia Mine to Etna Mine and to Inez Mine, thence northwards along the road from Inez Mine to Hartley, thence in the direction of the railway bridge to the starting point on the Umfuli River.



Sebungwe District.—From the confluence of the Sengwe and Lutope Rivers up the Lutope to its headwaters, thence in a south-east and easterly direction following the southern edge of the escarpment, leaving Meare's farm to the south, to the Mafungabusi Peak, thence northwards along the escarpment to the Njelele River, and down that river to its confluence with the Sanyati River, thence northwards down the Sanyati River to its confluence with the Piriwiri River, thence direct in a north-westerly direction to Picaninyemba, and thence along the footpath to Nenyunka on the Sengwe River, thence southerly up the Sengwe River to its confluence with the Lutope.

Lomagundi District.—An area bounded by a line drawn from the junction of the Angwa and Mkwichi Rivers, in a southerly direction up the Angwa to its junction with the Chumsenga River; thence easterly direct to the junction of the Hunyani and Msitkwe Rivers; thence northerly down the Hunyani to a point opposite Mokore Hill; thence westerly to the junction of the Angwa and Mkwichi Rivers.

Also an area bounded by a line drawn from the junction of the Chumsenga and Angwa Rivers up the Angwa to the point where the Sinoia-Urungwe Road crosses that river; thence along this road in a south-easterly direction to the Hunyani River; thence down that river to its junction with the Mesitkwe River; thence westerly direct to the point first named.

Game may be shot in these areas without a licence.

Game in Class "A" may be hunted in the close season until further notice on private land in the Melssetter district by holders of a licence.

Protected Areas.—No game may be hunted or killed within the limits of the Commonage or Townlands of Bulawayo and within a radius of two miles of the Court House, Gwelo, or within the Urungwe Game Sanctuary, as defined by Government Notice No. 237 of 1906.

"Locust Birds" are strictly protected, *vide* Government Notice No. 390 of 1912.

Export of Game.—No living Game or the Eggs of any Game Birds may be exported beyond the limits of Southern Rhodesia without a written permit.

Shooting on Private Land.—A licence does not entitle the holder thereof to shoot on private land without the permission of the land-owner.

No. 390 of 1912.]

[19th December, 1912.]

#### PROTECTION OF LOCUST BIRDS.

UNDER and by virtue of the powers vested in me by the "Game Law Consolidation Ordinance, 1906," I do hereby declare that the following Locust Birds:—

- (1) Great Locust Bird or White Stork (*Ciconia alba*);
- (2) Lesser Locust Bird or Nordmann's Pratincole (*Glareola melanoptera*);
- (3) Small White Heron or Cattle Egret (*Bubulcus ibis*);
- (4) Wattled Starling (*Dilophus carunculatus*);

are added to class "A" of the said Ordinance, and shall be strictly protected, and not hunted or destroyed, throughout Southern Rhodesia for a period of five years from date hereof.



No. 249 of 1908.]

[27th August, 1908.

## PROTECTION OF TREES.

IT is hereby notified for public information that any person who shall cut down for use as fuel, or for any other purposes than *bona-fide* farming, mining or manufacturing purposes, or cause to be so cut down the "Wild Westeria" (native name M'Pakwa or M'poea) tree, will be liable to prosecution for contravention of the provisions of the Forest and Herbage Preservation Act, 1859, and upon conviction to a fine not exceeding £100, or to imprisonment with or without hard labour for a term not exceeding six months, or to such fine and imprisonment, or to such imprisonment without a fine.

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No. 211 of 1909.]

[16th September, 1909.

## PRODUCE FROM NATAL AND TRANSVAAL.

UNDER and by virtue of the power vested in me by section 8 (2) of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction from Natal and the Transvaal of the undermentioned produce thereof:—Grass, straw, hay, lucerne hay, forage, green lucerne, sugar cane, or any other bedding or fodder plant.

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No. 44 of 1914.]

[5th February, 1914.

ESTABLISHMENT OF POUND ON IMPOFHOE FARM,  
HARTLEY DISTRICT.

UNDER and by virtue of the powers vested in me by section 5 of "The Pounds and Trespasses Ordinance, 1903," I do hereby declare and make known that at the request of the Civil Commissioner, Hartley, a Pound has been established on the farm Impofhoe, in the magisterial district of Hartley, and that the said Pound shall be available for the public as from the 9th February, 1914.

## Department of Posts and Telegraphs, Southern Rhodesia.

Postal Notice No. 12 of 1913.

### AGRICULTURAL PARCELS POST.

IT is hereby notified for public information that, on and after the 1st August, 1909, any article produced, and, if manufactured, produced and manufactured within Southern Rhodesia may be transmitted by Agricultural Parcels Post at the reduced rate of threepence per lb. or fraction thereof, up to a limit of eleven lbs. in weight.

The Agricultural Parcels Post is designed to bring the producer into direct communication with the consumer, and is available for the transmission of :—

|                        |             |              |
|------------------------|-------------|--------------|
| Biscuits               | Dried Meats | Plants       |
| Bread                  | Eggs        | Poultry      |
| Butter                 | Flour       | Seeds        |
| Confectionery          | Flowers     | Sugar        |
| Cigarettes             | Honey       | Tobacco      |
| Dried & Bottled Fruits | Jam         | Wool Samples |

and other articles produced within Southern Rhodesia. It does not extend beyond the borders of Southern Rhodesia.

The senders of articles at the reduced tariff applicable to the Agricultural Parcels Post will be required to sign a declaration that the contents are the *bona fide* produce of Southern Rhodesia.

The limits of size and weight, and the general regulations, are those applicable to the Inland Parcels Post.

G. H. EYRE,  
Postmaster General.

General Post Office, Salisbury,  
31st March, 1913.

### SPECIAL RATES FOR FRUIT EXPORTED OVERSEA.

THE Beira and Mashonaland and Rhodesia Railways announce that, with effect from 1st January, 1914, fruit for export oversea, beyond South Africa, will be conveyed from any station on these Railways (including Broken Hill-Congo Border section) to Beira at a maximum rate of 20s. per ton, and to Union Ports at a maximum rate of 30s. per ton, Station to Station, Owner's Risk.

## ADVERTISEMENTS.

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**British South Africa Company.**

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**GOVERNMENT FARM, GWEBI**

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# AT STUD

### **FRIESLAND BULL.**

***Dutchland Colantha Sir Cornucopia.***

No. 92,533 A.H.F.H.B.

This bull was recently purchased from Mr. A. J. MacLaurin, by whom he was imported from the United States of America. He comes of a family of very noted milking powers. The record average production over seven days of his dam and grand-dam was 30-40 lbs. of butter.

**Fee £2 2s.**

### **SHORTHORN BULL.**

***Favourite Pride.***

A pedigree red shorthorn bull, bred by Mr. James Durno, Rothiebrisanne, Fyvie, Scotland, and imported in 1911, and entered in the Coates Shorthorn and South African Stud Books.

**Fee £2 2s.**

### **LARGE BLACK BOAR.**

***Honingberg Bridgman II.***

No. 195, S.A. Stud Book, vol. vi.

Bred by Mr. S. C. Skaife, Bloemfontein.

**Fee 5s.**

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**ALL FEES ARE STRICTLY PAYABLE IN ADVANCE.**

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Full particulars regarding above may be obtained on application to the  
**DIRECTOR OF AGRICULTURE, Salisbury.**





The first Maize Reaper and Binder in Rhodesia at work at Messrs. Smith and McLellan's Farm, Cromdale. Makwiro.





THE RHODESIA  
**Agricultural Journal.**

*Edited by the Director of Agriculture,  
assisted by the Staff of the Agricultural Department.*

PUBLISHED BI-MONTHLY.

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VOL. XI.—No. 5.]

JUNE, 1914.

[5s. per annum

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## Editorial.

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*Correspondence on subjects affecting the farming industry of Southern Rhodesia is invited. Enquiries will be replied to direct, or through the medium of the JOURNAL. An interchange of ideas and suggestions between farmers will be particularly welcomed. Contributions of a suitable nature for insertion in this JOURNAL will be much appreciated. All communications regarding these matters, and advertisements, should be addressed to the Editor, Department of Agriculture, Salisbury.*

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THE LEGISLATIVE COUNCIL.—The agricultural interests of the country have received a very large measure of the time of the first session of the enlarged Legislative Council. The Land Settlement proposals are of first importance, and the debates have crystallised the hitherto somewhat nebulous ideas concerning the subject and given definite form to the subject. The amendment of the mining law very vitally affects farming interests, and whilst a spirit of mutual friendliness actuates the two great industries, yet each is concerned in protecting and advancing its own interests. Consideration is being given to the question of com-



pulsory dipping and to modification of the game law. Two measures of general utility to the agricultural community have become law, subject only to ratification by the Imperial authorities; one dealing with compulsory statistics, the other with the sale of fertilisers, farm foods and pest remedies. These matters are of such direct and vital interest to farmers that no apology is made for the publication *in extenso* of the debates on these subjects.

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**THE FARMERS' TOUR.**—The South African farmers who are touring Great Britain and the continent at the invitation of the Union-Castle Company leave Cape Town by the “Kildonan Castle” on the 6th June. The Rhodesian delegates are:—Mr. John Martin, Melsetter; Mr. E. Wilson, Salisbury; Mr. J. H. Finch, Marandellas; Mr. A. Peake, Umvukwe; Mr. A. P. Shone, Somabula; Mr. J. Reid Rowland, Plumtree; Mr. E. A. Hull, Matopos; Mr. F. A. Readman, Victoria; Mr. W. Leggate, Hartley; Mr. W. Ilsley, Mazabuka, N.W.R.

The arrangements, after arrival in England, at present are:—From 24th June to 14th July, tour England and Scotland; 15th July, cross from England to Holland; 16th July, Rotterdam and The Hague; 17th July, visit various herds, institutions, etc., at Rotterdam, and arrive Amsterdam in evening; 18th July, Alkmaar, Heilo, Myenburg and Hoorn; Monday, 20th July, Amsterdam and Leeuwarden; Tuesday, 21st July, visit cattle farms, creameries, etc.; Wednesday, 22nd July, Groningen, etc; Thursday, 23rd July, Wageningen; Friday, 24th July, Arnhem, Deventer, Loo and Apeldoorn. On Saturday, 25th July, the delegates return to England, and after that a certain number will probably proceed to Canada.

It is with pleasure we note that the Railway Administrations of Southern Rhodesia and the Union have granted the delegates free railway facilities to and from the Cape.

We wish the delegates *bon voyage*, and feel sure the tour will prove extremely instructive and the means of acquiring knowledge which will be of very great assistance in the future farming practice of this country.

THE TOBACCO SALE.—The sale by auction of the 1913 tobacco crop, arranged for the 6th May, had to be abandoned, owing to the paucity of buyers. The only buyers who attended were Mr. Risien (representing the United Tobacco Company) and Mr. Truter, of Kimberley. These gentlemen were allowed to tender for what they required, and, other tenders being received after the abandonment of the sale, some 445,000 lbs. were disposed of in this way. We understand the Tobacco Planters' Co-operative Society have decided to export the balance of the bright leaf to England for disposal there, and to send Home samples of the darker leaf, with the object of securing orders for the quantity on hand.

The tobacco on the sale this year amounted to approximately 2,240,000 lbs., which constitutes a record. The quality varied very considerably, and although there was a good quantity of high grade leaf, the proportion of inferior quality leaf was far too great. We have time and again in these columns urged growers to pay more attention to quality than quantity, and although the point has been particularly emphasised in various quarters during the last few weeks, we cannot let this occasion pass without impressing upon all concerned the vital necessity for an improvement in the general standard of the leaf. In accordance with the arrangement come to with the Rhodesia Tobacco Planters' Co-operative Society, the successful flotation of which we are pleased to record, the tobacco this year was pooled and divided into various grades, which amounted to a total of 58, reserve prices being placed upon the various grades.

It certainly seems as if, for the moment, we have exceeded South African requirements, and a little time is needed to enable present stocks to be absorbed. We trust the efforts to establish a market in England will meet with success. In this connection it is interesting to note the remarks made by Mr. Zimmerman at the meeting of planters held on 6th May. Mr. Zimmerman said:—"During his recent visit Home he shewed some samples of their tobacco to certain people, and he was surprised to find the opinion held regarding Rhodesian leaf in England. Firms out of the ring valued their bright leaf at 1s. 6d. and the dark at 11d., while firms in the ring valued the leaf at from 11d. to 1s. all round."



The cable from the Board of Directors of the British South Africa Company, London, read by Mr. Inskipp at this meeting, as follows:—"Referring to your telegram, 30th April, bright Virginia leaf realising higher prices here than ever before. London offers excellent market for bright yellow and orange, but proper packing, grading and uniform quality essential. Market would accept large quantity of this leaf if price reasonable,"—is certainly a good augury. From what can be gathered, the demand in America for Virginia leaf is overtaking the production; and the prospects of selling our tobacco in England at profitable prices appear very favourable. But, of course, first and foremost, there must be quality.

The absence of South African buyers at the sale is very disappointing, in view of the fact that we had reason to hope that the manufacturers below were gradually replacing the imported tobacco with the South African product, of which Rhodesian leaf had the preference. Unfortunately, we find that during 1913 592,654 lbs. of unmanufactured tobacco were imported into the Union from the United States of America, against 363,025 lbs. in 1912. This is practically all bright tobacco, and it is this variety, protected as we are by the Customs tariff, that we hope to supply. However, the position is not as we hoped, and it is obvious that the alternative is export.

There is no reason to be pessimistic in regard to the future of the tobacco industry, and we feel sure that if the growers wholeheartedly support the new Society, many of the difficulties at present confronting them will disappear.

The following were the directors of the Tobacco Planters' Co-operative Society appointed at the meeting held on the 6th May:—Messrs. J. McChlery (Salisbury), O. Zimmerman (Lomagundi), L. L. Green (Marandellas), L. Black (Salisbury), E. H. South (Hunyani), E. W. Noakes (Mazoe), J. H. Finch (Marandellas), E. S. Knight (Hartley), D. R. Templeton (Salisbury), C. S. Wilmot (Marandellas), G. M. Odium (Salisbury), T. Fletcher (Norton), P. H. Gresson (Salisbury), T. Sloan (Marandellas), A. R. Lilford (Salisbury).

It was decided to leave five vacancies to be filled by nominees of certain companies interested in tobacco.



**CATTLE OWNED BY NATIVES.**—We quote the following interesting particulars extracted from the report of the Chief Native Commissioner for the year 1913:—“Among the more progressive natives there is an intelligent disposition to improve the breed of their cattle. A factor tending towards the improvement in native-bred stock is the European stock farmer, who very rightly insists, as one of the conditions on which his native tenants may be permitted to run their cattle on his land, on all native bulls of an inferior quality being castrated, the farmer granting them the use of his own superior bull.

“The returns submitted shew that the native holdings in horned cattle are 377,090, as compared to 344,698 for the previous year; it is further estimated by the Native Commissioners that approximately 20,000 head were disposed of to European traders. Several reasons are given for the smaller proportionate increase in small stock, notably the larger number slaughtered during the time of famine, losses sustained by the depredations of wild dogs, and the prevalence of scab among goats during the winter months. The number of sheep now owned by natives is estimated at 265,870 and goats 628,645.

“The estimated number of horses, mules and donkeys now in the possession of the natives is given at 3,370. The demand for donkeys, for which there is always a ready sale, continues.”

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**NATIVE AGRICULTURE.**—According to the report of the Chief Native Commissioner, the estimated acreage under cultivation by natives in Southern Rhodesia during 1913 was 860,133, an increase of 7,000 acres over 1912, yielding 1,938,411 bags of grain. The feature of the year's crop was the increased acreage of mealies sown. The necessity of improving the quality and increasing the variety of the seeds sown has always been urged upon the natives. They realise the poor results which naturally accrue if crops are continually grown on the same patch of land. Successful attempts have been made by the more advanced natives to improve the productive powers of the soil, but the general inclination is to break up new lands, and in this respect the use of the plough, which

enables them to prepare larger areas for cultivation more expeditiously, is gaining in favour every year. The number of these implements now in use by the natives is estimated at 4,280.

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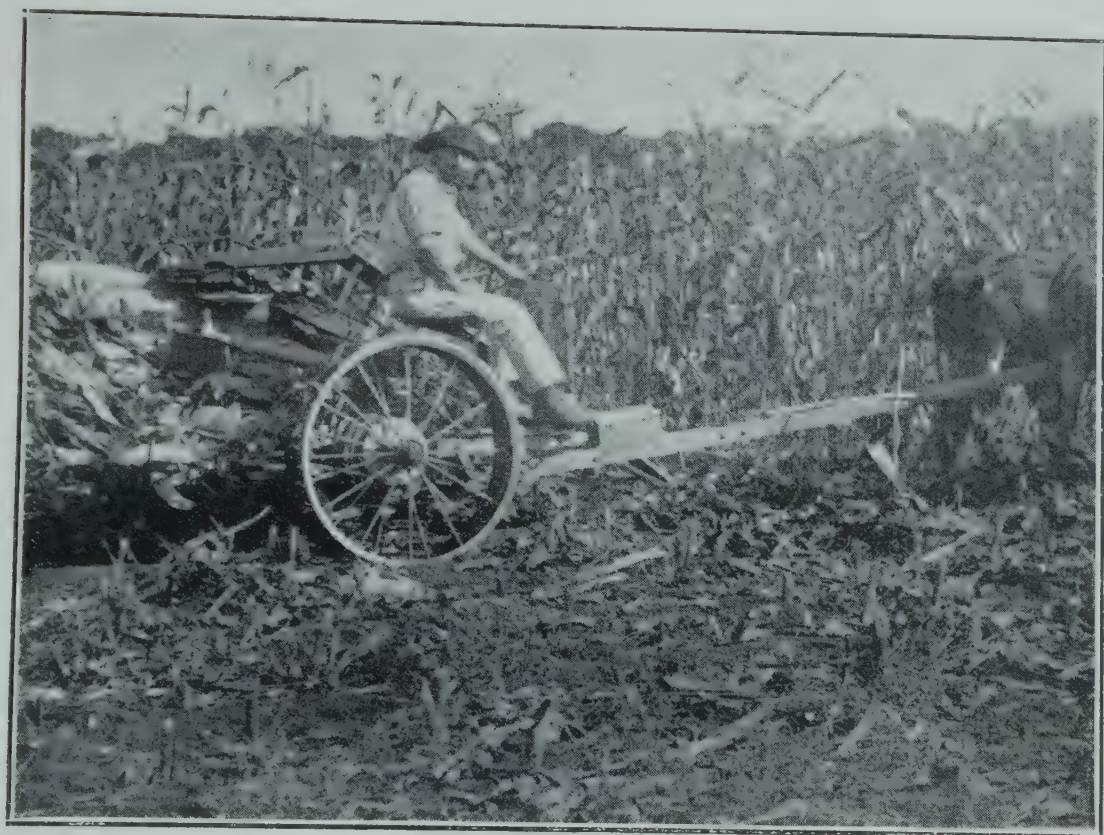
**VELD BURNING.**—The Herbage Preservation Ordinance was promulgated in July, 1913, and the Chief Native Commissioner, in his report for the year 1913, states that, partly owing to this measure and partly owing to the increasing good sense of the natives, grass fires have been practically non-existent. In several districts the natives have approached the Native Commissioner with a view to the relaxation of the law in respect of reserves; they maintain that the long grass attracts the larger carnivora, and they suffer severe losses in stock from the depredations of these wild animals. It is also claimed that, as a result of the preservation of the pasturage, ticks and mosquitoes are more numerous.

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**THE FIRST MAIZE REAPER AND BINDER IN THE COUNTRY.**—The accompanying illustrations shew a maize reaper and binder at work on the farm of Messrs. Smith and McLellan, Cromdale, Makwiro. The introduction of this class of machinery, though possibly not in itself an economy, will undoubtedly facilitate the better working of our farms, since, with the present methods of reaping by hand and later turning in stock to feed down the stalks, ploughing is often unduly delayed. When ploughing is thus postponed until July and August, late crops of weeds are permitted to seed, the soil becomes excessively dry and hard owing to evaporation and trampling by the stock, and it is often extremely difficult for the ploughs to do good work. Further, much of the maize fodder is trampled down and wasted, while stalk borer and other insect pests can only be attacked by grubbing out and burning the roots, a costly and laborious process.

When the crop is cut with a reaper and binder, the ploughs can follow immediately upon the harvester. The land being still moist, deeper ploughing can be practised, the soil will turn up in better order, moisture will be conserved, clods



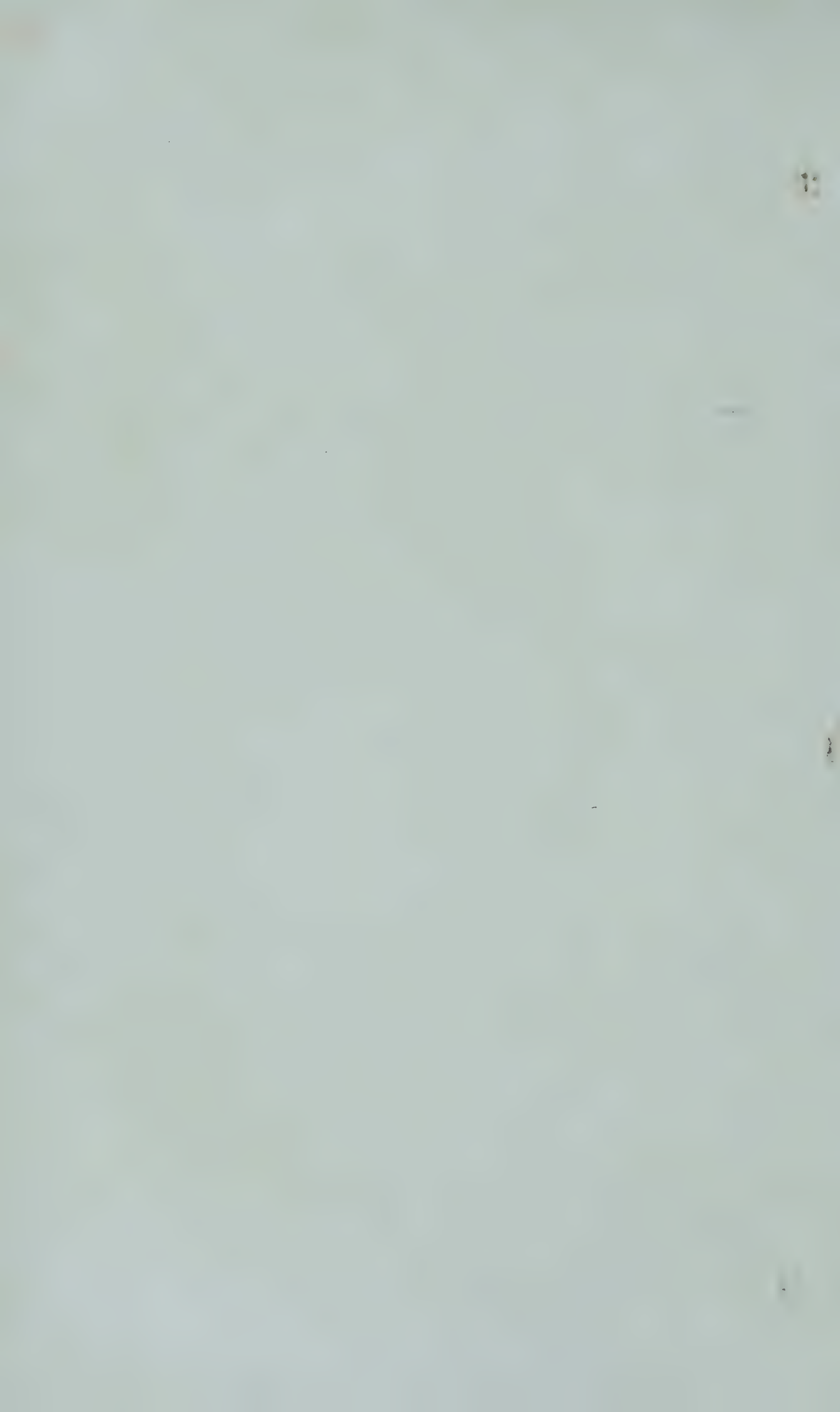


Maize Reaper and Binder at work—Cromdale, Makwiro. Ready to tie a bundle.



As machine leaves field after cutting—Cromdale, Makwiro.





can be broken down without waiting for the rains, and as a result earlier planting—one of the secrets of successful maize growing—is rendered feasible.

On the other hand, the reaper and binder is of little use unless accompanied by a husker and shedder and a power thresher outfit. The machine cuts the stalks and ties them in bundles, after which they are set up in stooks to permit the cobs to ripen more thoroughly, since the binder is usually operated just before the stalks are quite dry. From the stooks the bundles are ridden to the husker and shedder, which sheds the stover and passes out the husked ears, which are then put through the sheller. The reaper and binder on Messrs. Smith and McLellan's farm is drawn by six oxen, and, when seen by the writer, was doing very satisfactory work. Machines of this class will cost in Rhodesia about £50 to £60, and it remains for experience to prove what their working life is and to what figure the annual repair bill will amount.

We understand that the owners are willing to answer enquiries regarding their reaper and binder, and also to shew the machine at work to visitors. Local experience is the only safe guide in the introduction of such new types of labour-saving machinery, and Messrs. Smith and McLellan are rendering good service to the farming community of Rhodesia by their progressive policy.

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**RHODESIAN HIDES.**—The brief but instructive notes in this number on the curing of hides and skins by Mr. Rosenthal, of the Rhodesian Export Company, Salisbury, will be read with interest, dealing as they do with a detail of farming which, though in itself so simple, yet means a considerable gain or loss to farmers, butchers and dealers all over the country.

The export of ox and cow hides from the Territory is now assuming considerable dimensions, the figures for 1912 being 316,728 lbs., valued at £12,600, and for 1913, 479,644 lbs., valued at £21,564. Recent personal enquiries amongst the leading produce firms at Port Elizabeth elicited the information that Rhodesian hides are held in low esteem, and fetch considerably smaller prices than they might otherwise do.

This is solely on account of the bad reputation for being cut and scored, owing to unskilful or careless flaying. It is perhaps not realised by the farmer or butcher when skinning a carcase that a cut or two in the hide reduces its value by 1d. per pound, or from  $7\frac{1}{2}$  to 10 per cent. of its price, or as much as 3s. on an ox hide, and 40 to 50 per cent. on sheep and goat skins.

This depreciation of 10 per cent., it should be noted, represents a matter of over £2,000 per annum needlessly wasted, apart from the loss of trade arising from a bad name. The reason for this reduction in price is that these cuts, though only penetrating partly through the raw hide, become holes or weaknesses in the finished article when split up for industrial purposes. This loss is quite needless, and however unwelcome the fact, yet the realisation of it may be salutary and helpful to us. Care in the first instance is all that is necessary, and with the ordinary knives there is no occasion to score the hides, although, to prevent all possibility of injury, a safety flaying knife, such as is used in the Brussels abattoir, may be employed. As every hide sent to the coast is carefully and individually inspected by experts before being shipped, it should not be long before any improvement in this respect will be noticed, and prices raised correspondingly, and our poor reputation, as contrasted to other parts of South Africa, removed.

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**MERINO WOOL SALES.**—As many of our readers will be aware, a small experimental flock of pure-bred Merino sheep has been run on the Gwebi Experiment Farm for the last two and a half years. The nucleus of the flock was originally purchased from the Gwelo district, where most of the ewes had been bred, and it has since been strengthened by the importation of a few pure Merino ewes and rams from the Cape Province. The only serious trouble experienced with this flock has been due to blue tongue, and this has now been overcome by inoculation. In January the last two seasons' clip of wool was consigned to the London Wool Market for sale. The 1912 clip, which had been stored for upwards of eighteen months, realised 8d. per lb., and the 1913 clip  $8\frac{3}{4}$ d. per lb. The weight of the average clip per sheep was  $7\frac{3}{4}$  lbs.



Similarly, on the Longila Experiment Farm, in Matabeleland, a small flock of cross-bred Merino-Persian sheep has been run for upwards of two years. The clip from these sheep averaged about 5 lbs. per head and realised  $7\frac{1}{2}$ d. per lb on the London market. This flock has been almost entirely free from disease since it was placed on the farm. It now numbers 70 head, and is being graded up with Merino rams bred at Gwebi. In view of the fact that the wool was unwashed, and that no attention was paid to skirting or specially preparing for market, the prices realised may be regarded as satisfactory, and indicative of the prospects for woolled sheep in Southern Rhodesia. Rams from the pure-bred Merino flock on the Gwebi Government Farm are obtainable at a uniform price of £4.

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VEGETABLE OILS.—The proposal to establish an oil industry in Rhodesia has aroused considerable interest, and some particulars regarding the demand that exists at the present day for vegetable oils may not be out of place at the present moment. As is probably known, Marseilles is one of the greatest vegetable oil milling centres of the world. In the year 1902, according to the Indian Trade Journal, there were imported into Marseilles 171,788 long tons (2,240 lbs.) of ground nuts, while at the time of writing ground nuts represent 60 per cent. of all the oil-bearing seeds annually passed through the Marseilles oil mills. The average oil content is given at 30 to 40 per cent.; and in May, 1913, the quotations were, for shelled nuts, £18 to £21 per ton (2,240 lbs.). With unshelled nuts 25 per cent. of the weight is represented by shells, so that in exporting unshelled nuts one quarter of the freight charges is being paid on valueless material. In contradistinction to the increase in the ground nut trade, is a marked reduction in the imports of castor oil beans, which in 1902 totalled 26,214 tons, against 15,786 tons in 1912.

The position to-day is that the supply of animal oils is shrinking very rapidly, and the manufacturer has perforce to obtain his supplies from vegetable sources. Not only is this the case, but oils are being used more and more in the production of household commodities, and herein is the farmer's

opportunity. In the manufacture of soap and candles vegetable oil is largely used, and it is interesting to note that our imports of the former commodity from the Union during 1913 amounted to £19,658, while from oversea we obtained soap valued at £5,004. Soap has risen 1d. per lb., or £8 per ton, owing to the rising price of fats and oils. For candles, during 1913, we paid £19,818. The demand for butter has led to the substitution, wherever possible, of margarine, a pure wholesome product, in spite of prejudice to the contrary, and this is made principally from cocoanut and cotton seed oils. Cocoanut oil has within twelve months risen from £42 to £47 per ton, and cotton seed oil from £19 to £30. As a lubricant in the axle boxes of railway carriages, vegetable fats are used, while difficulty is being experienced in procuring sufficient supplies of linseed oil required in the manufacture of paints, varnishes and linoleum.

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WINTER WHEAT.—On the opposite page will be seen two photographs of a dryland winter wheat crop grown on Mr. N. C. Wright's farm Endsleigh, Marandellas district. Regarding this crop, Mr. Wright states the soil was a medium rich, naturally moist sandy vlel, which had been ploughed up and well worked a year previous to seeding. The seed, which was supplied by the Agricultural Department, was Early Gluyas, and was sown towards the end of April, 1913. The average height of the straw was 3ft. 9in., and the yield when reaped in September about four bags (800 lbs.) per acre.

The sample ears forwarded by Mr. Wright were of excellent quality, being about 3ins. in length and well filled, while the grain will compare favourably in size and bushel weight with any wheat yet grown in Rhodesia.

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IMPORTATION OF LIVE STOCK FROM GERMANY.—We call attention to a short descriptive article dealing with the merits of Friesland cattle and Merino sheep procurable in Germany, with which we have been kindly favoured by Dr. F. Guradze, Agricultural Attaché to the Imperial German Consulate





Dryland Winter Wheat, grown by Mr. N. E. Wright.



Dryland Wheat, grown by Mr. N. E. Wright, Endsleigh, Marandellas.





General for South Africa. It will be recollected that whilst cattle have long been admitted to this country from East Friesland, it is only lately that the remainder of Germany has been thrown open. Accompanying these notes we have been supplied with lists of leading breeders and breeders' associations prepared to export cattle and sheep to Rhodesia, whose names we will be glad to furnish to anyone interested.

As examples, we may give the case of the East Friesland Herdbook Society of Norden, owning amongst its members 65,000 cattle, who are prepared to sell bulls at six months for £15 to £50, yearlings £40 to £200, and two and three-year-olds at £75 to £150. The prices of cows or heifers are, at six months, £15 to £30; at two years, £30 to £50; and at three years, £40 to £75. Merino rams are procurable at £10, £15, £25 to £50, and ewes from £4 to £10.

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REDUCTION IN RATE ON FERTILISERS.—It is with pleasure we record a further reduction in the railway rate on guano and fertilisers imported into this Territory. The reduction takes effect from 1st May, 1914, and is applicable to the Lomagundi and Mazoe branches. Under the old rate these lines did not get the benefit of the through rate from Beira, a further charge of 2d. per ton per mile being made for consignments transported thereto from Salisbury. The through rate of £2 per ton now applies to the Lomagundi and Mazoe branches, and it will be seen that the reduction is quite an appreciable one.

## Extracts from the Report of the Director of Agriculture for the Year 1913.

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FARMING CONDITIONS DURING THE YEAR.—The season of 1913 was remarkable for its lateness; indeed, at one time a drought was feared, but this was fortunately averted throughout the greater portion of the country by copious though late rains. This lateness affected the total quantity of the harvest to some extent, but on the other hand benefited the veld, which held out remarkably well through the winter. The calving season was thrown back two or three months, but the health and condition of young and old stock alike were exceedingly good. The conditions of drought called for special measures throughout a large part of Matabeleland. The railways instituted a system of very low rates for the conveyance of stock to regions where grazing and water were abundant, and farmers whose water or veld had given out were allowed to run their stock on unalienated land. Advantage was taken of these facilities in a number of cases, but many cattle-owners preferred to hold on without trekking whilst the slightest chance remained. Early rains much relieved the position, but the drought was none the less severe, and might have proved calamitous.

The drought, though causing much loss, has led to improvements in methods, and has forced economic practices upon the farmers which are not to be undervalued. In the face of these drawbacks and difficulties, solid progress continues to be made, and on every side permanent improvements are being effected—irrigation works, dams, wells, buildings, fences, dipping tanks, and the breaking up of land in anticipation of good years to come. These permanent improvements so generally met with give every assurance of rapid recovery of the farmers as soon as favourable seasons return. The active operations of



many large ranching concerns in Matabeleland, public companies and private undertakings alike, the general and remarkable good health of live stock, and the demand for cattle of all descriptions, testify to the rapid development of the pastoral industry in spite of bad times, financial and climatic. In consequence of this inadequate and partial rainfall arable farming has made less headway in the west than in the eastern and northern districts. The midlands, where no drought occurred, are making rapid progress. Farms are being taken up, ranches are being established, and land long held vacant is being surveyed into holdings of suitable size, which find ready buyers. There has been a remarkable increase of cattle and sheep, which latter have been brought up from the south and are doing well. The Gwelo Creamery has from the start proved a great success, and a bright future seems assured, and on all sides farmers are preparing, by procuring heifers of a dairy type, to produce and send cream to the butter factory. The extension of the railway to Victoria is attracting settlement in that direction, and there has been a considerable influx of settlers. It is, however, noticeable that a number of these are not financially in a position to take up land for themselves. Hartley, it is reported, enjoyed the best season on record, though a late one. Farming there is progressing rapidly, both as regards crops and stock, much of which is of a higher class than is commonly met with, a number of good heifers and superior bulls from the Union and from oversea having been introduced. Owing to the mining activities in the district, there is a large local market scattered about amongst the farms, bringing consumer and producer into particularly close contact. The Makwiro district is also one deserving special notice, on account of the good progress made with arable farming. Throughout the northern parts of Mashonaland rains were abundant and the season generally good, though the crops yielded less than was anticipated from appearances, the rain generally being somewhat late. The demand for land is considerable, and the rise in price of such land as has changed hands is a good demonstration of the increasing prosperity of the country as a whole. In the eastern districts satisfactory progress has been made, and there has been a marked increase in the stock owned by Europeans. In Melssetter a steady augmentation of the farming community is to be noted.

The agricultural shows were entirely creditable and most instructive. Cattle were debarred at Bulawayo and Salisbury, but at Gwelo this section, especially in the native classes, was extraordinarily well filled, and bore ample evidence to the merits of the cattle of the country. A very promising show was held for the first time in Hartley, demonstrating the strides made in the locality. These gatherings are of specially educative value in this young country, the resources of which are but partially realised, and where farmers have relatively few opportunities for seeing what others are doing and what the potentialities of their lands may actually be. To this end the experimental work of the Department, as well as the other branches of research on behalf of the farmers, are demonstrated at these shows, and always attract much attention, arousing an interest and awakening enquiries which enable the officers concerned to guide and help farmers, to ascertain their difficulties and to advise and instruct them in the ways most needed by them.

A reliable index of the prosperity of agriculture is the sale of agricultural implements, and from information received from merchants it appears that the demand considerably exceeds their expectations, and gives assurance of steadily increasing areas under cultivation, and hence of larger returns. The trade statistics for the year indicate for importation of agricultural implements £34,327, as against £29,268 in the previous year, an increase of nearly 18 per cent. Power maize shellers made their appearance some years ago, and have proved entirely successful and a great benefit in enabling farmers to deal in a few days with crops which previously took many weeks of laborious hand work. The past year has seen the introduction of several steam and oil ploughing outfits, and although their usefulness is likely to be restricted, yet in certain circumstances they can assuredly do profitable work. They are an indication, too, that arable farming is being prosecuted on a large scale, for costly machinery of this description must be constantly employed in order to prove remunerative, and is not purchased by the small farmer or the beginner.

LABOUR.—The shortage of rain has in general been more severely felt by natives than by Europeans, consequently labour has, with certain exceptions, been more plentiful than



in previous seasons. As natives come out to work they learn to appreciate the advantages derived therefrom, and become familiarised with the idea of wage-earning and the amenities of such life. The supply of labour acquainted with, if not skilled in, farm work is thus steadily increasing, and the old aversion to employment at last shews signs of giving way. A feature of even greater consideration and much greater extent is the return of northern boys who, after a period of work in Southern Rhodesia, had been repatriated, and now come back on their own account independently of the Labour Bureau, and often to the self-same farms on which they worked before, where they beg to be re-engaged, and are much aggrieved if not required. This is an excellent sign, and a testimony both of the treatment accorded them in the past by their masters and of their own desire to be usefully employed. In those districts which are remote from access to northern boys, the scarcity of labour is still felt, however, and the indigenous natives, unless pressed by hunger, shew little inclination to work. Thus the Civil Commissioner, Victoria, reports: "Labour has been very scarce throughout the year. The natives, having plenty of food and beer, absolutely refuse to do a hand's turn, except in their own lands. When they do offer themselves they are generally lazy and untrustworthy."

CROPS.—Generally crops have been abundant, except in the western districts already referred to. The quality of grains and forage harvested has been excellent, and the acreage and variety of crops are increasing continuously and more rapidly than is generally supposed, although for lack of adequate facilities no reliable estimate can be formed as to areas or yields. The year's crop of maize was short in some districts, and, following on a previous year of deficiency, stocks became exhausted, and there was but little export; indeed, actually imports of maize and maize meal exceeded exports by 7,500 tons, the Customs returns for both maize and maize meal being as follows:—

|                             | 1913.           | 1912.           |
|-----------------------------|-----------------|-----------------|
| Imports ... ..              | 24,511,425 lbs. | 27,176,877 lbs. |
| Exports ... ..              | 9,443,892 lbs.  | 3,031,298 lbs.  |
| Difference (imports) ... .. | 15,067,533 lbs. | 24,145,579 lbs. |



It will no doubt come as a surprise to many who speak of the danger of over-production of mealies to learn that the balance of trade is an importation of our staple grain. Unfortunately figures of this kind are all that is available, and we have no means of gauging the amount of maize harvested last year, nor the stocks now in the country as contrasted with this time last year, so that the actual position is obscured. It is known, however, that at the end of the year there was still not a little unsold maize in the granaries of the country. There was a small export of maize to Europe last year, and there is every prospect that with normal seasons export will once again assume considerable proportions, until such time as the increasing production is equalled by local consumption for human use, for feeding to fattening cattle, and for bacon, possibly also for industrial purposes. Until that time comes, export to the south, the Congo and oversea markets is our natural and most convenient outlet. The high quality of our maize is being maintained.

**FERTILISERS.**—The use of fertilisers has hitherto been small in Rhodesia, and until recently has been confined almost entirely to tobacco. A greatly increased interest in this subject has arisen, largely as a result of experiments and demonstration by the Department, and artificial manures are now being used on a much larger scale for maize, and other crops also. It is found that compared to European standards much lighter applications suffice. In spite of the very high prices the use of artificial fertilisers is rapidly increasing.

The value of artificial manures imported into Southern Rhodesia during the last eight years has gone up by leaps and bounds in a phenomenal manner, as the following figures shew:—

|             |      |             |        |
|-------------|------|-------------|--------|
| 1906 ... .. | £114 | 1910 ... .. | £1,764 |
| 1907 ... .. | 615  | 1911 ... .. | 3,497  |
| 1908 ... .. | 854  | 1912 ... .. | 8,713  |
| 1909 ... .. | 876  | 1913 ... .. | 15,222 |

A large portion of the price of our fertilisers is due to freight by sea and land, and when it is recollected that the above figures are based on the value for Customs purposes at point of origin, the magnitude of the trade and its rapid

growth are better understood, and it will be realised that the use of artificial fertilisers is an established and important element in our agricultural practice.

In this connection, therefore, a fresh subject arises for consideration. As is perhaps unavoidable at the present early stage, there is a considerable amount of misconception and ignorance as to the value and uses of artificial manures, and misapprehension as to what constitutes the fertilising ingredients. No one is able to discriminate from mere appearance between the relative values of one or another of the various brands of fertilisers on the market. Most farmers are unfamiliar with the chemical terms used in referring to fertilisers, and many are even ignorant of the properties of the ingredients. The composition of different fertilisers varies greatly, and it is comparatively easy to use descriptive terms which totally mislead the consumer and lead to loss and disappointment. This species of fraud not only injures the unfortunate buyers, but prejudices the public as to the effectiveness of artificial manures in general. The magnitude which the trade has now assumed, and the prospects of its permanency and growth, warrant steps being taken by means of legislation to protect alike the farmer and the dealer against misleading description or actual fraud. This matter is receiving earnest consideration.

**LIVE STOCK INDUSTRY.**—The cattle industry is rapidly assuming that paramount position which has long been prophesied by those conversant with the country. Maize, tobacco and other crops have proved themselves invaluable in giving speedy returns to the farmer in his early years, yet it is to cattle that people look for the more remunerative if the slower return. A sense of security against contagious disease now exists, and the likelihood of such outbreaks as may occur getting out of hand is now discounted. For this we have to thank the efforts of the veterinary staff and the system of prevention and control which is in force, as well as the growing popularity of the dipping tank, and the general observance of the regulations existing for the control of the movement of stock. On all hands a strong desire to own cattle is being manifested, and prices of breeding stock are, in consequence, high; higher, indeed, than can be expected to continue, and higher



than are likely to be obtained for the progeny in after years. Our sources of supply of foundation stock have been limited to our own Territory, the Free State and parts of the Cape Province and Northern Rhodesia, and are further restricted by the unfortunate necessity of imposing an age limitation on stock from the south as a precautionary measure against the introduction of lungsickness and tuberculosis. There is also a keen demand for bulls, and the value of grading up our stock into more productive and remunerative forms by crossing is now becoming generally recognised. It is realised that under the methods of farming now possible to the enterprising man who lays in stores of winter feed for his cattle, and who uses a dipping tank and erects fencing, a class of stock much superior, that is more profitable, may be maintained than was the case under the more primitive conditions. The value of commencing early with the process of grading is also realised, as it is seen that whilst the number of cows is comparatively small, the effect of the introduction of good blood goes much further than it would do later on as the numbers increase. A third factor affecting the position is the high price of meat to the consumer, an element which it may confidently be anticipated will ere long be eliminated through the natural action of the economic law of an increasing supply. These developments are by no means unexpected, and are but the logical outcome of good seasons and the steady increase in the number of occupied farms.

An estimate of the number of cattle in Southern Rhodesia at the present time has been prepared. The census of 7th May, 1911, shewed 463,923 head in all. A conservative estimate of the cattle in Southern Rhodesia furnishes in round figures 600,000 head, of which 230,000 are owned by Europeans and 370,000 by natives. Although not beyond the actual numbers, this figure is not far from correct. Statistics of this description are, however, exceedingly difficult to obtain, owing to the wide distribution of the stock, the unfenced freedom in which the greater part run, the frequent changes of ownership, and secrecy of the natives on the subject. For similar reasons only approximate figures can be given for:—horses 1,500, mules 2,800, and donkeys 6,000, whilst for small stock, such as sheep, goats and pigs, no reliable figures are at present procurable. The natural increase on 600,000 head of cattle.



assuming one quarter to be cows, and allowing on 75 per cent. of these to rear calves, is 112,500 head. Importations should not be less than last year, say about 6,500 head. Judging the losses by mortality and consumption by the export of hides—479,644 lbs. at an average weight of 20 lbs.—we have to deduct 23,982, say 24,000 head, which leaves a probable total of about 695,000 in the coming year.

A feature of cattle raising in Rhodesia is the low average mortality. Neglect, accident, prejudice and ignorance, and in individual cases Coast Fever, may lead to loss, but these are exceptional circumstances, and apart from them the general mortality has been trifling. Apart from such abnormal losses, with ordinary good management and the systematic use of the dipping tank, the mortality of grown stock may be reasonably estimated at 3 per cent., whilst that of unweaned calves is about 10 per cent. On one of our largest ranching concerns, the figures, based on a total of over 12,000 head, are  $2\frac{1}{2}$  to 3 and 10 to 12 per cent. respectively, whilst in another instance of 4,000 head they have averaged 4 per cent. over all ages. These figures contrast favourably with those of other countries in this respect.

Notwithstanding the numbers of stud stock introduced into Rhodesia, there is yet a large unsatisfied demand for pure-bred bulls, chiefly of the following breeds: Shorthorn, Friesland, North Devon, Hereford, Sussex and Afrikander; indeed, bulls are the chief need of the Rhodesian cattle breeder to-day. It is to be regretted that on the one hand there are such grave risks of loss connected with the importation of stud stock from oversea, whilst on the other there is so much need for caution in introducing cattle to Rhodesia from other parts of Africa where diseases practically or altogether unknown to us are prevalent, such as tuberculosis, pleuropneumonia, anthrax, gall-lamziekte, quarter-evil, etc.

With the simultaneous increase in the numbers of farmers and of cattle in the country, periodic public stock sales are being established at suitable centres, such as Gwelo, Makwiro, Macheke, Bindura, Marandellas, Eldorado and Plumtree, and are proving most successful. It is estimated that from native sources 20,000 head, including cows, heifers and oxen, have been bought by Europeans, drawn mainly from our southeastern districts.

To meet in some measure the dearth of good bulls, the Government has long had in contemplation the breeding of pure cattle and the distribution of young locally-reared sires which are naturally inoculated on the veld. Numerous unexpected difficulties have arisen in the past, but on the Gwebi farm there have now been collected 18 Friesland and 3 Short-horn cows, together with a particularly fine bull of each breed, so that a beginning, albeit an inadequate one, has been made in this direction. It will, however, be a long time before there are any stud bulls available for distribution to farmers. There is urgent need of taking up this matter on more adequate lines.

Sheep are receiving more and more attention. The importation from the south mainly for slaughter purposes is very considerable, viz., 60,574 head, including goats, during the period under review. There is a demand for mutton and goat flesh on the mines as well as in the towns. It is generally and rightly considered that sheep cannot be put on to raw veld, but that they may advantageously be introduced on mixed farms where the veld has been in parts cut for hay and eaten down by cattle, and where there are stubble lands to run them on. In the naturally favoured parts, such as Melssetter, sheep-breeding is gaining ground, but it is also coming into prominence in the midland districts. Merinos are the chief breed, and the Persian to some extent, whilst the Arabi is being experimentally tried. There is need for the mutton breeds of England to be given a trial.

As the herds and flocks increase in numbers, more and more is heard of the depredations of lions, leopards, wild dogs and crocodiles, and serious complaints have been received from many parts of the country.

HEALTH OF STOCK.—As regards diseases of stock, it may be said that whilst African Coast Fever still sporadically reappears, evidenced by the fact that seven distinct outbreaks have occurred, yet in no case has the disease got out of hand, and where the outbreaks have been discovered early the mortality has been trifling, in each of two instances only one animal dying. Where, however, the disease had established itself before being detected, losses are heavy, as at Collaton and N'Odzi. Horsesickness was in its season very prevalent.



Redwater and gallsickness are endemic in the country, but beyond necessitating precautionary measures with imported animals, these cause little anxiety. Other contagious diseases in the country, all fortunately of much less significance, although demanding the watchful attention of the Veterinary Department, are rabies, ophthalmia, tsetse fly disease (rare), spirochætosis (very rare) and tuberculosis (one instance); and blue-tongue and scab in small stock. There were no cases of anthrax, quarter-evil, glanders nor lungsickness.

Legislation, having for its aim the extinction of rabies, came into force on the 1st January, 1913, and the registration and taxation of dogs at once led to the extermination of a great number of superfluous dogs all over the country. For those retained, the tax has been readily paid by Europeans and natives alike, and it has brought in a revenue of £15,553 10s., representing 62,214 registered dogs. It is a notable fact, and one hardly to be regarded as a coincidence, that whereas in 1912 outbreaks occurred in nine districts, in some of them repeatedly and at various seasons between May and December, in 1913 only one single case has been reported.

The free shooting of game allowed in the neighbourhood of Hartley, with the object of eliminating tsetse fly from that populous area, appears to have achieved its object in very large measure, as the fly is by no means as abundant as formerly, and though domestic stock are more widely distributed over the district, very little is heard of their being fly-struck. The suppression of trypanosomiasis amongst cattle, consequent on the reduction of fly by driving away the game, cannot be proved to demonstration, but certainly, as in the case of the destruction of dogs to eliminate rabies, everything points to this result having been obtained.

Preliminary precautions have been taken to provide for the possible advent of rinderpest from the north, where, particularly in German East Africa, British East Africa and Uganda, the disease is existent. There is no immediate danger, and all possible preventive measures have been taken. An event of considerable importance was the meeting of a veterinary congress at Bulawayo, summoned by His Excellency the High Commissioner, Lord Gladstone. Representatives of the Union of South Africa, Portuguese East Africa,



the Mozambique Company, Congo, British East Africa, Nyasaland and Northern and Southern Rhodesia, Bechuanaland, Basutoland and Swaziland were present. Joint measures for dealing with the possible advance of rinderpest were discussed, and opportunity was taken of considering a number of other matters connected with the health of domestic animals throughout the continent.

**DIPPING TANKS.**—The advantage, amounting almost to a necessity, of regular dipping of cattle as a preventive of infection of tick-borne diseases and for the destruction of these blood-sucking pests is no longer a matter of opinion, and is now generally accepted. In many parts of the country the proposal to render dipping obligatory is favourably entertained, and legislation of a permissive character to this end is under consideration. The demand for grants-in-aid has exceeded all expectations, and strained our resources to meet, but it has proved a great help, inducing many to build tanks who would not otherwise have done so, and spreading a knowledge of the advantages to be gained from the process. A tank, whilst benefiting mainly and directly the owner, is yet an obvious advantage to the whole community, and the presence of tanks all over the country is an end to be greatly desired. The number of tanks in existence at the end of last year was 325, and during the period under report 45 have been erected, whilst applications for further grants are constantly being received. No other single preventive measure can compare with this precaution against many ailments, and the general health of regularly dipped herds is so noticeable in contrast to others that the profit in condition and in reduced mortality, without consideration of the security in case of epizootic outbreaks, amply warrants erection of tanks on every farm.

**LEGISLATION.**—In the Legislative Council three Ordinances closely affecting agricultural interests were carried—the Animals' Diseases Partial Repealing Ordinance, the Herbage Preservation Ordinance and the Water Ordinance.

**FENCING ORDINANCE.**—The provisions of the Fencing Ordinance have been adopted in a number of centres where population is close. The example of those districts is being followed now by others, and the area under its operation is steadily expanding as the development of the districts pro-

ceeds and farmers can afford to erect boundary fences. During the year portions of Mazoe, Salisbury, Hartley, Insiza and Bubi districts have adopted this law. Fencing generally, whether on boundaries or of internal paddocks, is extending rapidly, and is now a prominent feature in most farming districts, the advantages being too obvious to be gainsaid.

**HERBAGE PRESERVATION ORDINANCE.**—Grass fires have been notably few this season, and the whole aspect of the country is changed from what it used to be towards the end of the dry season. The beneficial results are very marked, grass being abundant everywhere, and cattle in better condition than before, whilst no complaints are now received of farms denuded of herbage, nor of the necessity from that cause of moving cattle to seek grazing. Small buck and game birds have also been benefited. In parts of the country the drought prevented the growth of grass, elsewhere late rains kept the grass green and too moist to burn for longer than usual, but the main cause of the absence of veld fires is undoubtedly the recently passed “Herbage Preservation Ordinance, 1913,” which has impressed Europeans and natives alike with the importance of the subject.

**GAME ORDINANCE.**—The existing game law has been the subject of careful enquiry, and preparation has been made for its revision by the Legislative Council to meet present conditions, which have greatly altered since the Ordinance came into force in 1906. Whilst prompt and strong measures are called for to preserve certain of the rarer fauna, on the other hand much injury is caused by some classes of buck now protected, and it is time that the interests of the game gave place to the claims of crops and cattle. The suspension of the game law in a large part of the district of Hartley has synchronised with a general reduction, if not the complete disappearance, of the tsetse fly, and, whilst it is impossible to prove that this is a case of cause and effect, yet it is difficult to dissociate the two facts, and there is at least sufficient common-sense reason, if not scientific justification, to warrant the continuance of these measures in a district the progress of which was a few years ago much hampered by the prevalence of fly, and where now mining, transport and farming operations are carried on with very little loss from this pest. Indeed, so strong does the connection appear



to be between game and tsetse, that an experiment on a large scale has been undertaken in conjunction with the Medical Department in the Sebungwe district. Careful observations are from time to time being made as to the spread or otherwise of the fly within an area in which free shooting has been permitted for the period of a year. A similar step on a small scale has been taken in a fly belt adjacent to occupied farms in the Lomagundi district. These efforts to fight fly are of considerable interest in connection with similar attempts being made in other African states to deal with the same subject.

**POUNDS ORDINANCE.**—Under the “Pounds and Trespasses Ordinance, 1903,” ten new pounds have been established and two abolished, making a total of 28 now in the country.

**BRANDS ORDINANCE.**—The number of brands registered during the year under the Brands Ordinance is 516, of which 408 are for Europeans and 108 for natives, an increase of the former of 51 and a decrease of the latter of 169, as compared with the numbers registered in the previous year. The total number of brands now registered in the country is 4,984, of which 3,738 are owned by Europeans, and 1,246 by natives.

**PROGRESS OF THE DEPARTMENT.**—Although there has been a notable increase in the volume of work of all branches of the Department, both of a consultative and administrative character, for reasons of finance no corresponding expansion in the undertakings and personnel has been possible. In these circumstances, continued and increased activity can only be recorded, but nothing in the nature of fresh developments. This regrettable fact must tell adversely on the usefulness of the Department to the farming community, which may not realise that the unfortunate attitude of marking time is not a matter of policy but merely a question of funds, and that we are prepared and anxious for an active advance whenever circumstances will permit. In spite of these adverse conditions, the best possible relations exist between the farmers and the Department. Indeed, the demand for our services exceeds the power of our staff, and the requests for help are more than we can cope with adequately. Besides the natural growth of existing branches, such as those of live stock, crops, chemistry, etc., there is need for expansion into new spheres. Farmers are demanding advice in directions in which the Department is not



able adequately to help them, and, whilst doing what one can, the services of specialists in other branches, such as horticulture, forestry, dairying, poultry management, as well as additional assistance in the already existing branches of veterinary research, agriculture and engineering, and in the clerical staff, are wants the need of which is becoming daily more pressing.

The organisation of fresh activities and the completion of the constructive development of the Department being largely suspended, the work of the Director of Agriculture has been more that of supervision of both departmental activities and of general agricultural conditions throughout the country by means of personal visits to districts and to individual farmers. It is realised that much is to be gained and learned by this personal contact, and from the study at close quarters of the problems, interests and anxieties of the farming community. During the year 878 visits were paid to farmers in their homes by officers of the Department of Agriculture.

It must be recognised that the measures adopted by the Veterinary Department in dealing with contagious disease in Southern Rhodesia are proving effective, when the position to-day is contrasted with what it was only a few years ago, and the increasing numbers of stock are taken into consideration. The control of movement of stock, even in clean areas, is undoubtedly very helpful in maintaining the freedom from epizootic disease, and the system of movement under permit has undoubtedly contributed very largely to the present satisfactory position. The creation of ox transport areas, too, has now justified itself, and, provided reasonable elasticity is exercised in adjusting the boundaries of areas to changing conditions as the country develops, the system is likely to be continued for some time. The increase of the practice of dipping, so strongly urged by the Department, has materially improved matters, both as regards the health and the condition of cattle, and its general adoption appears to be only a matter of time.

The work of the Veterinary Laboratory has been continued, although research has necessarily been somewhat interrupted by the vacation leave, extended for the purpose of European study, of the Veterinary Bacteriologist. The subjects which have received special attention include piroplas-

mosis, anaplasmosis, ophthalmia, spirochætosis, trypanosomiasis and horsesickness. Inoculation of cattle, mules and donkeys now partakes of the nature of routine work, although it is recognised that there is still much that is obscure and which requires further investigation to elucidate. Diagnostic examination of smears also constitutes part of the regular duties, whilst, in conjunction with the Chemist, numerous cases of poisoning are investigated, and a large number of dips tested. Veterinary research is recognised to be one of our most important and active occupations.

The experimental work at Salisbury, and at the Gwebi and Longila farms, continues to furnish valuable additions to our knowledge of the crops suitable to this country, and the best means of cultivating and handling them. The field of investigation is vast, and the process of experimentation necessarily slow, but it is very satisfactory to observe how rapidly crops, till recently almost or altogether unknown, are being adopted into the ordinary farm practice of the country. There is no end to experimental research of this nature, and the task of bringing discoveries to the notice of those concerned is continuous; but it may confidently be asserted that the possibilities of arable farming are yearly being enhanced, the methods of culture improved, and the farmers are readily adopting new ideas and themselves experimenting in these directions. By means of the co-operative experiments wherein the Department supplies parcels of seed to farmers to try on their own soil, the nature of new crops or new varieties is brought to general notice, although many unfortunately fail to furnish reports from which data can be compiled as to the prospects and possibilities of certain crops in different regions. The information gleaned is made public through the pages of the *Rhodesia Agricultural Journal*, and by advice, both oral and written. There is room for extension and development of this work, so as to keep pace with the increasing number of farmers and the settlement of new districts.

The compilation and publication of a handbook on tobacco culture in Rhodesia occupied some time. The work has been very well received by tobacco growers here and in other parts of South Africa. The time of the tobacco expert is mainly occupied in travelling from farm to farm where tobacco is



grown, giving advice, and, during the curing season, in curing barns of leaf to shew farmers how it should be done. During the year 198 farms were visited, but it is noticeable that since the end of the last curing season there has been a marked falling off in the number of enquiries for advice regarding tobacco.

The advice of the Agricultural Engineer is in constant demand, and it is beyond his powers to overtake, single-handed, all applications for advice. During the twelve months he has personally paid 113 visits to farms, examining and reporting upon irrigable areas amounting to upwards of 1,400 acres, as well as advising with regard to wells, boreholes and allied matters. There is much evidence throughout the country of an increased attention to the cultivation of crops under irrigation during the dry season, whilst preparations are being made to utilise the provision of the Water Ordinance which was promulgated during the last days of the year.

The Chemical branch has been kept very fully occupied. Large numbers of soils have been submitted for advice as to suitability for various crops, especially tobacco, lucerne, maize and oranges. In some cases complete analyses are needed, but as a rule a qualitative examination of chemical and physical properties suffices. Enquiries are proceeding with regard to certain soils containing excessive quantities of magnesian salts, and considerable additions to our knowledge of this matter have been made, but there is still need of much more systematic study of this subject, which is of vital importance in certain districts. Elsewhere manganese and lime have been found to be in excessive quantity, and the cause of local injury to the soils, but to a much less extent than magnesia. Numerous analyses also have been made of deposits of possible value as fertilisers containing phosphates, potash, nitrates or lime. A number of analyses of milk, water, limestones, artificial manures, oil beans, tanning barks, contents of stomachs in cases of supposed poisoning, and other articles of possible use or of an injurious character have been made. The strength used in public and private dipping tanks, and the reported deterioration of dip by oxidation, have been the subject of much enquiry. Great discrepancies have been brought to light, and it has become evident that farmers have yet much



to learn as to the necessity for and the proper means of regulating and maintaining the strength of the fluid used for dipping cattle. This is a matter which can best be remedied by the slow process of individual advice and constant public references to the subject. Manurial experiments have been conducted and wide publicity given to the results. The great expansion that is taking place in the use of fertilisers is due in large measure to the teachings of officers of the Department, especially the Chemists, through the medium of lectures, reports and articles and individual advice and practical demonstration.

The knowledge of insect pests—their identification, their life history and the best means of combating them—constitutes a necessary and useful part of the activities of the Department of Agriculture, and the Entomologist's branch is well occupied with such enquiries. Insects destructive to maize, sorghum, tobacco, potatoes, onions, pumpkins, beans, fruit trees, native timber, grain and baled tobacco leaf have been studied. Information on these matters is disseminated mainly by lectures, through the *Agricultural Journal*, by bulletins, and direct reply to numerous enquiries addressed to the Entomologist, and by visiting farms to make investigations into insect attacks on the spot. A number of hitherto unrecorded pests are being discovered, and these require to be identified, as well as having their haunts and habits recorded, whilst the life history of many species known to science has yet to be studied. In these directions a remarkable amount of work has been achieved, as the report of the Entomologist indicates, although more might have been done if an adequate insectary were available.

The subject of main general interest at the present time is that of the spread of tsetse fly within our borders. Much useful research has in past years been devoted to this subject, and recently the Entomologist has again made an extended tour of the fly areas, mapping them and ascertaining to what extent they are changing their position. Active steps, so far as present knowledge allows, for combating this pest by dealing with the game, are being taken, but there still remains much to do in this connection.

Locusts, which have not been seen for years, happily continue to absent themselves, no swarms whatever having been reported.

The Assistant Chief Veterinary Surgeon went on a special mission to German East Africa to enquire into matters relating to the outbreak of rinderpest there, and extended leave for purposes of special study was granted to the Agriculturist and the Veterinary Bacteriologist, and the results obtained amply justify this policy of enabling technical officers, on the necessarily rare opportunities of so doing, to become conversant at first hand with the recent advances of their special subjects. The light of science is thus in a practical way diffused over this remote portion of the globe, and brought to bear on the many unelucidated mysteries on which our progress and development depend so largely. Fruits of these studies are already in evidence, and reference will be found in the respective annual reports to what has been done.

INSTRUCTION IN AGRICULTURE.—Farmers' associations throughout the country are shewing considerable eagerness to hear lectures from different members of the staff. It has not been possible to meet all requests of this kind, though, so far as possible, meetings are attended, and some 36 addresses have been given in this way. The expert staff of the Department are primarily intended for the work of research, which, along with helpful advice to farmers, is their daily avocation. All officers of the Department have, however, done their utmost in this direction, both in the Salisbury course of instruction and in lectures all over the country. Technical education in agriculture is a separate sphere of work, and one urgently demanding attention in this young and growing country, where the needs of the future require to be foreseen and provided for as thoroughly as any immediate demand. In more advanced countries such facilities are, as a matter of course, in existence, and there are no calls for the heavy expense of initiation and establishment, but only for maintenance and expansion. In Europe, America, Australia, England and South Africa, schools of agriculture are recognised as part of the necessary machinery for the advancement of agriculture, and such institutions are found in active operation everywhere and increasing in numbers. Instruction in arable farming and stock raising under local conditions is a great and pressing need for the prospective farmers, whom everyone is now expecting to see coming to Rhodesia during the next few years in much greater numbers than hitherto. The Board of the



British South Africa Company during the year announced its willingness to provide the needful resources for the establishment of such an institution in Rhodesia.

A course of lectures similar to that held last year was again arranged and successfully carried through. Useful as such efforts no doubt are, they are far from sufficient to meet the needs of the case. It is impossible to give systematic tuition in the very brief period of three weeks devoted to these annual courses. In concentrating on practical aspects of subjects, the teacher is compelled to pass over the fundamental principles. The students, however eager, and in this respect those attending the Salisbury lectures left nothing to be desired, are yet unable in the short time to assimilate the general laws which underlie the teaching given, which to them, therefore, consists of only so many isolated pieces of advice, like recipes in a cookery book, instead of one consistent whole, a science applicable to every event which may arise in their subsequent farming experience.

At the Government experiment farm, Gwebi, facilities have been provided for the reception of resident pupils, who may enjoy every opportunity of learning the practical details of arable and stock farming, but no attempt can yet be made to supply class-room tuition there, and the sole object at present aimed at is to give prospective settlers some little insight into local methods before commencing on farms of their own. The experimental work is conducted on so large a scale as to be the same as ordinary commercial farming, the best known methods are adopted, and a much larger range of crops is dealt with than is as yet the case on ordinary farms, so that exceptional opportunities for gaining experience exist, but this is very far removed from the combined theoretical and manual training of an agricultural school.



## The Rainy Season in Southern Rhodesia.

By the Rev. E. GOETZ, S.J., of the Bulawayo Observatory.

In a preceding article I have shewn that the dry season lasts well into October and sometimes even later. The rainy season has occasionally started early in October and ended late in April, but these are exceptions. For practical purposes it is best not to expect the rains before the end of October or the beginning of November, nor is it wise to expect any useful rain after the end of March—at least in the west.

The rains do not as a rule start suddenly; there is nearly every year a somewhat lengthy preparation. In September and October the temperature rises steadily; the days which were at first warm and cloudless, with generally a nice steady breeze, become hot and oppressive. Clouds appear practically every morning towards nine or ten o'clock, flat-based cumulus clouds at first, which disappear at sunset, a sure sign that the breaking up of the yearly drought is not near yet. After a while these clouds, which at first stood out on a bright blue or at most a hazy background, seem to float in front of a rather dense sheet of thin, white, shapeless clouds, alto-stratus or cirro-stratus clouds; they do not then disappear at night, but, on the contrary, they coalesce towards sunset into dark masses that persevere throughout the night, and are the seat of electrical manifestations. Sheet lightning becomes frequent, distant rumblings of thunder are heard, and some afternoon a thunderstorm will pass overhead. Only too often this will be a dry thunderstorm, giving only a few hundredths of an inch of rain. The lower air is still very dry, as is shewn by the wet and dry bulb thermometers, which indicate at the time a difference of from 25 to 35 degrees Fahrenheit. Rain may be seen to fall in sheets some distance away, but it does not reach the ground: it is evaporated in the hot and dry lower atmosphere, and rises again to the upper strata, to be condensed

again into rain clouds. A day or two later a more serious fall puts an end to the drought—the rainy season has started in earnest. This season is not, of course, as is imagined by people living in temperate zones, one of continuous rains. It is the season during which the country as a whole gets most of its yearly rain. Along the eastern ridge of Southern Rhodesia the rain of this season represents from 85 to 90 per cent. of the year's fall; in the rest of the country it represents about 95 per cent. Some years the whole of the year's rainfall will fall during this season, and in many centres five and even six months on end without a drop of rain have on several occasions been recorded. The rains come generally in spells of a week or a fortnight's duration, during which some rain falls practically every day. These spells are followed by a period of dry weather, often cloudless at first, with a high barometer. After a few days the barometer begins to drop again, the heat increases, clouds gather again, lightning and thunder are to the fore, and a new spell of rain, usually introduced by an afternoon thunderstorm, sets in again. Owing to the fact that a large percentage of the rain is due to afternoon or evening thunderstorms, the mornings are generally fine. An analysis of the rainfall, hour by hour, for three years, at Bulawayo, shews that only 12 per cent. of the rain that fell during this period fell between 6 a.m. and noon, whilst 73 per cent. fell between noon and midnight.

Before going any further, I give here a table of the rainfall at some selected stations. As this table is compiled for the use of the farmer rather than the statistician, I have drawn it up in a way which I think more useful to the agriculturist than the usual way. In the dry season I have put the five months in which no useful rain is to be expected. The other seven months, in which good rains are liable to fall, are reckoned as rainy months, but I repeat the caution that both October and April are as often as not practically dry months, and, when they have been wet months, most of the rain that has been registered has fallen at the end of the former and at the beginning of the latter. As in the remarks that are to follow I shall point out that there is a notable difference between the rains of the first half of the season and those of the second half. I have also introduced a division of the season into spring and summer.



Table 1. — Southern Rhodesia Rainfall.

| STATION        | Years | May                                    | June | July | Aug. | Sept. | Dry Season | Oct. | Nov. | Dec. | Spring | Jan.  | Feb.  | March | April | Summer | Rainy Season | Year  |
|----------------|-------|--|------|------|------|-------|------------|------|------|------|--------|-------|-------|-------|-------|--------|--------------|-------|
|                |       | <b>Eastern Range of High Altitudes</b> |      |      |      |       |            |      |      |      |        |       |       |       |       |        |              |       |
| Helvetia       | 7     | 2.25                                   | 1.06 | 1.59 | 0.89 | 0.87  | 6.66       | 1.73 | 5.42 | 8.45 | 15.60  | 12.73 | 14.59 | 8.55  | 4.04  | 39.91  | 55.51        | 62.17 |
| Melsetter      | 14    | 0.89                                   | 0.70 | 0.81 | 0.21 | 0.52  | 3.13       | 1.68 | 5.38 | 6.60 | 13.66  | 9.17  | 10.69 | 6.09  | 1.71  | 27.66  | 41.32        | 44.50 |
| Inyanga        | 7     | 0.77                                   | 0.05 | 0.30 | 0.01 | 0.19  | 1.32       | 1.21 | 3.48 | 5.14 | 9.83   | 9.43  | 9.34  | 5.03  | 0.82  | 24.62  | 34.45        | 35.77 |
|                |       | <b>Watershed, Mashonaland</b>          |      |      |      |       |            |      |      |      |        |       |       |       |       |        |              |       |
| Umtali         | 14    | 0.71                                   | 0.37 | 0.28 | 0.28 | 0.58  | 2.22       | 1.28 | 3.36 | 4.58 | 9.22   | 7.68  | 7.76  | 4.08  | 1.21  | 20.73  | 29.95        | 32.17 |
| Marandellas    | 12    | 0.72                                   | 0.03 | 0.12 | 0.06 | 0.36  | 1.29       | 1.50 | 4.61 | 6.13 | 12.24  | 8.59  | 7.76  | 5.33  | 1.17  | 22.85  | 35.09        | 36.38 |
| Salisbury      | 19    | 0.47                                   | 0.03 | 0.01 | 0.10 | 0.33  | 0.94       | 1.26 | 3.81 | 5.94 | 11.01  | 7.52  | 7.29  | 4.79  | 1.03  | 20.63  | 31.64        | 32.58 |
| Hartley        | 10    | 0.29                                   | 0.00 | 0.00 | 0.06 | 0.18  | 0.53       | 1.52 | 5.14 | 6.16 | 12.82  | 7.64  | 7.44  | 4.28  | 0.55  | 19.87  | 32.69        | 33.22 |
|                |       | <b>Watershed, Matabeleland</b>         |      |      |      |       |            |      |      |      |        |       |       |       |       |        |              |       |
| Gwelo          | 14    | 0.28                                   | 0.05 | 0.03 | 0.14 | 0.09  | 0.59       | 0.87 | 4.29 | 5.28 | 10.44  | 5.63  | 4.89  | 2.76  | 0.77  | 14.05  | 24.49        | 25.08 |
| Hopefontein    | 24    | 0.17                                   | 0.09 | 0.11 | 0.05 | 0.18  | 0.60       | 1.10 | 3.90 | 4.48 | 9.48   | 7.56  | 5.36  | 3.22  | 0.91  | 17.05  | 26.53        | 27.13 |
| Bulawayo       | 16    | 0.26                                   | 0.04 | 0.07 | 0.04 | 0.18  | 0.59       | 0.92 | 3.92 | 4.91 | 9.75   | 5.52  | 3.89  | 2.84  | 0.61  | 12.86  | 22.61        | 23.20 |
| Empandeni      | 13    | 0.24                                   | 0.02 | 0.02 | 0.01 | 0.07  | 0.36       | 0.86 | 3.16 | 4.05 | 8.07   | 6.60  | 3.70  | 2.59  | 0.53  | 13.42  | 21.49        | 21.85 |
|                |       | <b>Slope to the Limpopo</b>            |      |      |      |       |            |      |      |      |        |       |       |       |       |        |              |       |
| Victoria       | 14    | 0.32                                   | 0.08 | 0.17 | 0.06 | 0.12  | 0.75       | 1.29 | 3.43 | 4.76 | 9.48   | 6.06  | 5.92  | 2.99  | 0.48  | 15.45  | 24.93        | 25.68 |
| Gwanda         | 8     | 0.09                                   | 0.04 | 0.06 | 0.01 | 0.06  | 0.26       | 1.28 | 2.64 | 3.83 | 7.75   | 5.06  | 3.74  | 2.18  | 0.37  | 11.35  | 19.10        | 19.36 |
|                |       | <b>Slope to the Zambesi</b>            |      |      |      |       |            |      |      |      |        |       |       |       |       |        |              |       |
| Mount Darwin   | 11    | 0.89                                   | 0.01 | 0.01 | 0.01 | 0.06  | 0.98       | 0.34 | 3.57 | 5.46 | 9.37   | 7.83  | 5.79  | 3.35  | 0.41  | 17.38  | 26.75        | 27.73 |
| Wankie         | 8     | 0.59                                   | 0.00 | 0.03 | 0.00 | 0.04  | 0.66       | 0.88 | 1.85 | 3.59 | 6.32   | 4.47  | 5.62  | 2.26  | 0.62  | 12.77  | 19.09        | 19.75 |
|                |       | <b>Limpopo Valley</b>                  |      |      |      |       |            |      |      |      |        |       |       |       |       |        |              |       |
| Tuli           | 14    | 0.29                                   | 0.07 | 0.01 | 0.02 | 0.16  | 0.55       | 0.83 | 1.88 | 2.57 | 5.28   | 3.85  | 2.18  | 1.48  | 0.58  | 8.09   | 13.37        | 13.92 |
|                |       | <b>Zambesi Valley</b>                  |      |      |      |       |            |      |      |      |        |       |       |       |       |        |              |       |
| Sebungwe       | 10    | 0.21                                   | 0.00 | 0.00 | 0.00 | 0.02  | 0.23       | 0.63 | 2.22 | 4.98 | 7.81   | 7.67  | 5.38  | 3.65  | 0.41  | 17.11  | 24.92        | 25.15 |
| Victoria Falls | 9     | 0.48                                   | 0.03 | 0.01 | 0.00 | 0.11  | 0.63       | 1.34 | 2.03 | 5.61 | 8.98   | 6.54  | 6.47  | 3.63  | 0.42  | 16.06  | 25.04        | 25.67 |



This table shews clearly that there is a marked sweep of the rain from east to west. The heaviest falls are along the south-eastern part of the Portuguese border. They gradually decrease from 55 or 40 inches south of Umtali to 35 inches north of Umtali, and go to 20 and 25 in the Portuguese part of the Zambesi Valley towards Tete. West of the eastern ridge of high altitudes the rainfall ranges from 35 to 30 inches along the Mashonaland watershed and from 25 to 30 along the Matabeleland watershed. Going south towards the Limpopo, the rainfall decreases as we get near the Limpopo and further from the eastern ridge. The rainfall varies from 25 inches in the east to 13 in the west. The western part of the Limpopo Valley is the driest region in Southern Rhodesia. The average rainfall at Tuli is only 13 inches, and in the 14 years on record it has varied between 7 and 20 inches.

Something similar seems to take place as we descend to the Zambesi Valley. Mount Darwin is drier than the rest of Mashonaland, and Wankie has also a lower average than the rest of Matabeleland. In the Zambesi Valley itself there seems to be a higher fall of rain, judging from the records of the Victoria Falls and Sebungwe, but there are no observations from the valley itself between the Falls and Zumbo. Famine is, however, rather frequent among the natives in that part of the valley, which seems to point to a deficiency in the rainfall. The same may be said of the valley east of Zumbo, although at Zumbo itself the rain is very abundant.

There are two distinct periods in the rainy season which, for want of a better name, I call the spring and summer periods. In the first period, which lasts till some time in December or January, the rainy spells are generally of short duration. The rains are due chiefly to afternoon or evening thunderstorms. This fact gives to this period a somewhat unsatisfactory character, as thunderstorms are apt to be local phenomena, and more or less capricious in their progress through the country. But the rain which falls in one place on one day is often partially evaporated and falls again elsewhere on the following days, so that by the end of December nearly the same average of rain has fallen throughout the country. The Melssetter district, on the south-eastern border, gets a notably larger amount of rain than the rest of the country. But along the watershed

there is little difference between east and west. There is a slight difference, due apparently to the altitude, as we recede from the watershed towards the Limpopo and the Zambesi Valleys. In both valleys the spring rains are less than in the rest of the country, and in the Zambesi Valley October appears to be a decidedly dry month. This period is usually followed by a notable interruption in the rains. I have described this in my previous articles.

The summer rains are rather different from the spring rains. These start generally in January and sometimes in December. During the previous months the interior of Africa has been steadily heated, and has become considerably hotter than the surrounding ocean. An upward movement of the heated air takes place over the land; it flows from above towards the Indian Ocean, and the air from over the ocean is drawn inland. We have, in fact, some kind of monsoon. This air is highly laden with moisture, for there is at that time along the eastern coast, from Mozambique to Natal, for a considerable distance from the shore, a warm ocean current, over which evaporation is consequently very active. The warm air over the ocean is capable of holding a large amount of moisture. When sucked inland, and forced up from four to six thousand feet into Rhodesia, along the eastern range, it cools rapidly, and abandons a great part of its moisture on the eastern part of the country. It comes considerably drier over the west, causing thus a great difference between the rainfall of Mashonaland and of Matabeleland during the second half of the season. The far east gets about twice as much rain as the west; Mashonaland gets as a whole from eight to ten inches more than Matabeleland. Hopefontain, near Bulawayo, has a large average for this period. This is due to a certain extent to its situation in the hills, and to the fact that its 24 year average includes some years of the early nineties, in which the fall was 70 per cent. heavier than the average fall in the subsequent years. Taking the average for the years which are included in the Bulawayo average, the Hopefontain summer rains are brought down to 15 inches.

On the coast, the rains increase steadily in intensity after December, and reach their maximum in March and end in May. In the Melsetter region they reach their maximum



towards the middle of February and end in April. In the southern part of the district, May is distinctly a rainy month. In the rest of Mashonaland the rains on an average increase in intensity up to the middle of February, after which they gradually decrease in intensity, and end in the first week of April. In Matabeleland the maximum is in January, and the rains end practically in the latter part of March. It is only occasionally that February is a month of very heavy rains in the west.

During this period thunderstorms, though frequent, are not so prominent as during the first period; the rains are what we may call land rains. They extend often over the greater part of Rhodesia at the same time, and the spells of rain last longer than during the first period. Practically all the long spells of rain recorded fall into this period. In 1899 Melssetter had 30 inches in February. It rained on every day of the month but one; on eight consecutive days in the middle of the month the rain registered ranged every day from one to six inches, the total fall for the week being 17.89 inches. The same rain spread right across to the west, but with diminishing intensity. Salisbury had 19 inches in 24 days, and Hopefountain 7 inches in 23 days. Whilst in the first part of the season rains lasting more than a few hours are comparatively rare, we may in this part of the season get steady rains that last one or two days, without interruption. In the west, rains of longer duration are rare, although there are some reliable records of protracted rains in the eighties—one in January, when it rained in Bulawayo and Hopefountain for 21 consecutive days without interruption, and one in February, when at Empandeni it rained for nine consecutive days without ceasing. Nothing of the kind has occurred since instrumental observations have been started.

Being in the tropics, Rhodesia has also two other features of the tropical regions; it is exposed to large fluctuations in the amount of the yearly rainfall, and it gets a large share of heavy individual downpours. Even in the short period during which observations have been taken, we find that the years of low rainfall gave in Rhodesia or in the neighbouring countries two to five times less rain than the best years. Thus the Hopefountain records start with a year of 17 inches, followed by two



years of 43 or 45 inches. Since then there has been a year of 12 inches only. In this same year a gauge, distant only some four miles from the Hopefountain gauge, registered nine inches only. Salisbury has a year of 49 inches and one of 22; Umtali one of 53 and one of 16; Melsetter one of 56 and one of 24. Bad years are, of course, more frequent and more disastrous in the west than in the east, and the fluctuations are generally greater; but this is not always the case. A ten year record of Lourenzo Marques includes a year of 60 inches and one of 14.

Owing to the frequency of thunderstorms, a large proportion of the rain falls in the shape of heavy downpours. These are not heavier than those registered in extra-tropical regions; in fact, the heaviest downpours recorded have fallen mostly in the temperate zones, but they are here more frequent. In Bulawayo the analysis of the rainfall hour by hour for three seasons gave the rate of about one inch and a half per hour for a quarter of the total rainfall. One fall of 1.40 inches in a quarter of an hour was registered in January, 1906. Hourly records are not available for other centres, but the following table of falls of one inch or more per day in four centres for several rainy seasons gives a fair idea of the intensity of our rainfall. The stations are arranged at increasing distances from the sea, to shew that these downpours are more frequent, as well as being heavier, as we recede from the coast:—

TABLE II.

Heavy rainfalls during the rainy season from 1898 to 1907.

| Station                              | ... | ... | Melsetter. | Salisbury. | Gwelo. | Bulawayo. |
|--------------------------------------|-----|-----|------------|------------|--------|-----------|
| Distance in miles from the coast     | ... |     | 130        | 290        | 320    | 390       |
| No. of days of 1 inch or more        | ... |     | 113        | 72         | 52     | 47        |
| Average fall per day, in inches      | ... |     | 1.82       | 1.67       | 1.60   | 1.53      |
| No. of days of 2 inches or more      | ... |     | 30         | 15         | 8      | 8         |
| Average fall on such days, in inches |     |     | 3.05       | 2.79       | 2.85   | 2.66      |
| Heaviest fall per day, in inches     | ... |     | 7.25       | 4.11       | 5.45   | 4.75      |

Such downpours may be expected in any of the five rainy months in any part of the country. They are to be taken into serious account by both the engineer and the agriculturist. To the latter they shew that the amount of water available for agriculture is notably smaller than that indicated by the figures given in the first table. The run-off after such rains is enormous.

Besides the loss from the run-off, there is also the loss incurred through the rapid evaporation of the light rains. Rains of less than one-tenth of an inch per day are of little value to the farmer. They are evaporated as a rule before they have benefited the plants. In Bulawayo, these light rains represent about 15 per cent. of the yearly fall. The same proportion holds for the greater part of the country. I have not the detailed rainfall at my disposal to find out the exact percentage for the various centres, but the following table for Salisbury and Bulawayo gives a fair idea of the frequency of the useful rains in the two localities:—

TABLE III.

Days of rain above 0.01 ins. and above 0.10 ins.

|                     | July  | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | April | May | June | Year |
|---------------------|-------|------|-------|------|------|------|------|------|------|-------|-----|------|------|
| BULAWAYO—17 YEARS.  |       |      |       |      |      |      |      |      |      |       |     |      |      |
| Above 0.01          | - 0.6 | 0.2  | 1.1   | 5.2  | 10.9 | 12.1 | 15.1 | 11.4 | 9.1  | 4.3   | 2.3 | 1.4  | 73.7 |
| Above 0.10          | - 0.1 | 0.1  | 0.4   | 1.9  | 7.1  | 7.6  | 9.8  | 6.2  | 5.2  | 1.5   | 0.6 | .00  | 40.5 |
| SALISBURY—13 YEARS. |       |      |       |      |      |      |      |      |      |       |     |      |      |
| Above 0.01          | - 0.3 | 0.5  | 1.3   | 4.2  | 11.8 | 15.5 | 17.7 | 18.2 | 13.0 | 4.2   | 1.9 | 0.6  | 89.2 |
| Above 0.10          | - 0.0 | 0.3  | 0.8   | 2.8  | 7.2  | 11.2 | 12.2 | 11.2 | 8.6  | 1.5   | 0.8 | 0.2  | 56.8 |

I should like to add a few words about forecasts of rain. This is, however, a delicate point. Weather proverbs and weather rules are found among the oldest civilisations. Babylonian tablets, 5,000 to 6,000 years old, embodying weather rules, have been found. It is, however, a curious fact that the natives of this country, who are in many ways shrewd observers of nature, have little or no weather lore, a fact which is significant considering of what paramount importance rain is to them. The reason is that the prediction of rain from non-instrumental observations is exceedingly difficult, at any rate in the western parts of South Africa. Most of the weather rules which are of any value for the prediction of rain, in Europe, for instance, can be classed into two main categories; those which refer to observations of winds, clouds, or the appearance of the sky, and those which refer to the behaviour of plants, or animals, or sometimes the appearance of inanimate beings. When compared to the well-established rules of modern meteorology, it is found that nearly all the popular weather rules which are worth anything for the prediction of rain, refer to the approach of a well-defined weather system.



known as a cyclone or low pressure area. It is to this frequently recurring weather system that the temperate zones owe the greater part of their rain. This type of weather is exceedingly rare in the country north of the Orange River. During the six or seven years during which the Johannesburg Observatory was in charge of the forecasting service for the Transvaal, they hardly ever had an instance of a cyclone passing over the tropical and sub-tropical part of South Africa. The South African weather is mainly ruled by a ridge of high pressures which encircles the globe at our latitudes. To help our imagination, we may consider this as a kind of mountain range of air, with peaks and passes. But this range has not a permanent position; it has an oscillatory movement north and south. During the winter months it stretches right across South Africa. The whole of the region below the tenth degree of latitude is under its influence. During the summer months it has receded below the Cape, and the interior of Africa would then appear as a slightly depressed plain. Besides this movement north and south, there is in the chain a movement east and west in our part of the southern hemisphere. There are in the ridge two areas of maximum altitude (*i.e.*, of maximum barometric pressure). During the winter months they move towards one another. One of them comes right over the continent, its mid-winter position being about the northern part of Cape Colony; the other one is just off the east coast. In summer they have separated; the western area is now off the south-west coast; the eastern one has shifted midway between Africa and Australia. As long as this system is over the land no rain is to be expected, for this weather system is above all a dry weather system. In summer, when it has left the land, good rains could be expected if no disturbing element intervened. This is the case especially in January or February, when we get in some seasons those protracted rains I have mentioned before. But this is not the case during the whole of the season. There is a succession from west to east of areas of high pressures that follow one another more or less rapidly. If this high barometer appears on the west coast, it will in the course of a day or two invade the southern tableland and form a high pressure area over Bechuanaland, the Transvaal and Southern Rhodesia, putting an end to the rain, and bringing with it its usual dry weather.



For the west, it generally means on the first day after the rain strong south-east wind with somewhat raw, slightly drizzly weather, followed by some days of fine, dry weather. At the end of this period the lower air is again considerably dry, and, when a lower barometer once more sets in, it takes sometimes several days of preparation before rain falls again.

If these high pressure areas follow in quick succession, we have the state of things which we have experienced during the last three years. December, 1912, was a notable example of this kind of weather. High pressure systems followed one another at intervals of a few days. During these intervals things became gradually promising, and when rain could reasonably be expected, the barometer suddenly rose, and a dry weather system set in which drove the rain away again for several days.

If this pressure system appears in the south-west of the Cape, it usually skirts around the inland low pressure area, and forms a system of steep descending gradients to the lowest inland barometric depression. In this case in the rainy season, we have extensive rains inland.

It sometimes happens; when two of these pressure systems follow one another rapidly, that the depression between them takes the special shape called a V depression. It may happen that a high reaching is just on the west coast when another is on the east coast. Sometimes, if we join by continuous line the points on the land where the barometer gives the same readings, these lines form a series of parallel Vs. with the apex north. The line on which the barometer reads 30 inches, for instance, may start from Cape Town, pass through Kimberley, Mafeking and Bulawayo, then turn and go down by Pretoria and Durban. The line 30.1 lies outside of the line 30.0 parallel to it; the line 29.9 in a similar way outside; the straight line bisecting this system of V-shaped lines will have a decreasing series of barometer readings from north to south. It is called the trough of the depression. This pressure system travels from west to east. In front of it the wind blows generally hard from a northerly direction. When the trough gets near, the air becomes hot and oppressive; dark masses of clouds bank up, there is a short calm, then a furious burst of wind from the south or south-west, with a thunderstorm, or only too frequently a mere

duststorm. The barometer rises with a jump, and a cold southerly wind follows for a day or two. This form of weather is fairly common in the south, and a fair amount of rain comes along with it. I have reason to believe that though it does not generally reach the tropics, we owe some of our thunderstorms and duststorms to it. In the temperate zone, instead of having mainly this procession of high pressure systems which bring dry weather, they have also a succession of low pressure systems, generally from west to east, which bring rainy weather. It is, therefore, easy to see that the popular weather rules which are often very successful for rain predictions in Europe do not hold in our case. It is, on the contrary, fairly easy to predict dry weather, or to foresee the continuation of the dry weather for the following 24 hours.

From these considerations, it is evident that the most important instrument for the study of our weather conditions is the barometer. But the interpretation of the barometer readings at single stations in the tropics is more delicate than in the temperate zones. In these zones the approach of a low pressure system is preceded by a sudden drop of the barometer, a drop of a notable fraction of an inch in a few hours. With us nothing of the kind happens. In the course of the last ten years I have not once registered a drop of two-tenths of an inch in 24 hours, and the extreme variation in the ten years does not reach three-quarters of an inch. If the barometer is read every day at the same hour (and corrected for temperature in the case of a mercury barometer), it will soon be apparent that the small variations that are noted from day to day have their significance. Let us suppose, for instance, that we start reading the barometer at, say, 9 a.m. on a day when, after a spell of rain, we have a strong east wind with coldish weather. If we read it again at the same hour the next day, we will probably find that the reading is slightly higher than on the preceding day. The wind is still south-east, and fairly strong. Yesterday we may have had a cold raw day, with a sky overcast by a veil of low, grey stratus clouds; to-day the veil is torn and we have patches of low, ragged, fast-moving clouds. The next day the barometer may read about the same again; the wind is still south-east; the sky cloudless. We are in for a period of dry weather, for a high pressure system is over the land. A little later in the day clouds may appear;



they are heat clouds, and are flat-based, standing out on a blue background. They disappear at sunset, without giving any rain. This may go on for several days. The wind is now E.S.E., and shifts slightly to N.E. or N. for a few hours in the middle of the day, but is generally back to E.S.E. or S.E. by the middle of the afternoon. Then one day we find that there is a clear drop in the barometer, a drop of five-hundredths or even one-tenth. The wind at nine o'clock is already in a northerly direction, and it is hot already. The day which follows is hot, and the air is oppressive; the clouds stand out on a white background; the wind veers with the sun; is north till about noon, N.W. to S.W. in the afternoon; a dead calm may set in in the afternoon; at night sheet-lightning is frequent; the clouds persist during the night. The high pressure area has moved off the land. We are now under the influence of the weather system which generally gives us our rains. The question now is: "Are we sure to get the rains?" It is now that the difficulty of forecasting without the help of daily weather charts is keenly felt. If the pressure along the coast is the same as inland, or slightly higher only, rain inland is uncertain. But if the pressure on the east coast is notably higher than over the land, and if the gradient, that is the rate of decrease of pressure inland, is steep, rain is fairly probable over Rhodesia. As we have no weather charts to guide us, we are greatly at a loss to decide with any degree of certainty from the bare indications of the meteorological elements at a single station. My experience in Bulawayo leads me to conclude that even when there are very good indications of rain in the first part of the season, we are disappointed when electrical manifestations are not prominent. Moreover, even when there seems to be a serious chance of a thunderstorm, we are again often disappointed if the lower air is dry when a thunderstorm passes overhead. This is especially the case after a spell of dry weather. The difference in the wet and dry bulb thermometer is then often considerable, shewing that the lower air is still very dry. In such cases a thunderstorm is apt to become a disagreeable dry thunderstorm, yielding only a few hundredths of an inch of rain, or turning into a duststorm. Rain seems to fall in sheets some distance away, yet we find afterwards that no rain has fallen in reality. The falling rain was evaporated again when it came into the dry



and hot lower strata of the atmosphere. The fact that a great part of our early rains come in the shape of thunderstorms is a serious drawback. We know but little about the formation of thunderstorms. Most of what we know can be condensed into the following words: "Thunderstorms are an indication of instability in the atmosphere," but what causes this instability, and especially what causes this instability in one locality and not in the neighbouring locality, or what causes a thundercloud to pour down its moisture in one place rather than in another, are on the whole still mysteries.

These are the main features of the weather in the rainy season, but there are, of course, many variations on this theme. There is, however, one form of weather that deserves further mention; it is the one alluded to before as introducing often a high pressure system. A sudden jump upwards of the barometer is often accompanied by a drop in the temperature and a considerable rise in the relative humidity. The sky is completely overcast by the low stratus clouds; the air is cold, raw and uncomfortably damp, yet no rain beyond an insignificant drizzle falls in that case. These clouds are not rainclouds. In a high-pressure area there is a downward movement of the upper cold dry air. The S.E. wind which we then experience is not a moist S.E. wind coming from over the ocean, but the S.E. portion of that downward whirl of the upper air. This cold dry air robs by conduction the lower warmer strata of part of its heat. This air, having become colder, goes below the dew point, *i.e.*, the point at which the invisible moisture in the air condenses, and thus low stratus clouds are formed. This kind of cloud formation never gives any rain. After a day or two a temperature equilibrium is established and the clouds vanish. A few instances have come under my notice, when very good rains followed a day or two after, but they have been very rare, and were due to the rapid breaking up of the high pressure system. The lower air was then still saturated with the moisture due to the condensation described above, when a sudden drop in the barometer indicated the disappearance of the high area. A thunderstorm was formed, and a good soaking rain followed. There was a notable instance of this in the middle of the dry season in July, 1907, when a cold raw overcast day was followed by a warm night with a thunderstorm and a rainfall of three-quarters of an inch.

We had a good example of it again in the beginning of February this year. At the end of January the barometer was low, the air hot, and the days cloudy. It gradually worked up to a thunderstorm on the 31st, when the barometer was lowest. There was then a sudden jump upwards of over one-tenth of an inch in the barometer. A cold, cloudy day with damp, drizzly weather and high S.E. wind followed. A high pressure seemed to have set in, but it did not persist. The next day there was a drop of nearly a tenth again. The stratus clouds continued, but a thunderstorm followed with the drop of the barometer. A day after we had a good soaking rain lasting twelve hours, and giving 1.13 inches.

On the whole, the general features of our weather are simple. The difficulty arises when one wishes to forecast the rain without meteorological instruments, or without data from other parts of the continent. Most of the changes in the weather come from the west, and to foresee them will be practically impossible as long as we have a dark continent west of us.

## Some Citrus Growing Experiences in Rhodesia.

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By R. McILWAINE, M.A., LL.B.

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In my pamphlet entitled "Orange and Lemon Growing in Southern Rhodesia," obtainable from the Department of Agriculture, the growing of citrus trees is dealt with in a general manner. In the present notes it is proposed to recount my personal experience, extending over a period of some fifteen years.

The site of my plantations was chosen with an eye to a good situation for a homestead, and not with the intention of growing citrus trees, but it might be mentioned that it is on the south-westerly slope of a kopje, about three miles north-east of Salisbury. The soil is of only medium richness, the surface is of a greyish nature, and becomes of cement-like hardness if not broken up immediately after rains. The sub-soil is a reddish clay, highly retentive of moisture, yet not so impervious as to become waterlogged—a condition fatal to citrus trees.

The first planting consisted of about 300 trees, comprising some eight varieties of orange, three of naartje, and three of lemon.

These trees were imported from the Botanic Gardens, Durban, and were all grown on the rough lemon stock, which appears to be a near relation of our own Mazoe lemon, but rather thornier. This original plantation thrived well, and produced a good quantity of fruit in the fourth year and for some years after, but recently the results have been somewhat disappointing. There was no running water available for



irrigation purposes, but I had every confidence in my ability to maintain a thriving grove by a systematic application of the "dry-farming" system. After the first rains the ground was broken up and left in a rough condition, to assist in the absorption of as much of the rainfall as possible. The growth of weeds, occasionally supplemented by a leguminous crop, was encouraged until some time in March, when all this vegetation was turned under with a view to adding humus to the soil and increasing its water-holding capacity. Immediately on the cessation of the rains, the grove was regularly cultivated every ten or fourteen days with a spike-toothed cultivator to a depth of about six inches. The result was that at the end of the most prolonged dry season the soil was perfectly moist immediately beneath the dust mulch caused by frequent cultivation, and the trees were in no way affected by drought. So far all was satisfactory, but another factor which eventually proved the undoing of a great portion of the grove had not been reckoned with. The continual cultivation during the dry season produced a layer of fine soil, almost dust, on the surface, and at the same time had a tendency to compress and harden the layer immediately beneath. As a result, the first heavy rains of the wet season swept away great quantities of the surface soil, exposing the hard layer under it. Endeavours were made to remedy this by digging deep cross-trenches at frequent intervals to hold up the water, but these soon became silted up with the loose soil and worthless. Beans and other crops were planted, with a view to holding the soil together and preventing wash, but as a rule the heavy thunderstorms of the early part of the season had worked considerable havoc before these crops were of much service. Dry-farming methods have been perforce abandoned on the more sloping parts of the grove, and the trees are consequently suffering from periodical drought and unthrifty. It now has become a question of either uprooting the trees or supplying water from boreholes at a considerable cost. Having regard to the value of a bearing grove, it is thought that the cost will be justified. In California, if a suitable site for a grove is available, the pumping of underground water from considerable depths is an accepted practice.

In a small portion of the grove, where there is no appreciable wash, owing to the level nature of the ground, the dry-farming method is still practised, with most gratifying



Jaffa Oranges.



Young Imperial Grape Fruit.







Mediterranean Sweet Oranges.



Valentia Late Oranges.



results. The conclusion to be drawn from the above experience is that while artificial irrigation may be dispensed with on sites possessing a soil retentive to water and not liable to wash from heavy rains, it is essential under all other conditions. Given the ordinary rainfall of most districts of Mashonaland, the irrigation of a medium sized grove should be no difficult task, if intelligent cultivation and humus-producing and conserving methods are adopted. Personal experience shews that under such conditions one good soaking when the trees are about to bloom, and another to assist in the setting of the fruit, is ample. If, therefore, sufficient provision is made for the storage of water, one good windmill could provide enough for the requirements of a good-sized grove.

As already mentioned, the first experiment was with a considerable number of varieties. The majority of these has nothing special to recommend them, but the following kinds are of outstanding merit:—

ORANGES.—Washington Navel, Valentia Late, Mediterranean Sweet and Jaffa. The *Washington Navel* is an orange of very fine quality, and is therefore of especial value for export purposes. Its drawbacks appear to be somewhat shy-bearing on the part of the tree and thickness of the rind of the fruit. It is very doubtful whether the *Washington Navel* will ever be to Rhodesia what it has been to California. It is interesting to mention in this connection that side by side with this variety another species of navel orange imported by me from Florida promises to be most successful; the fruit is of excellent quality, thin-skinned and perfectly seedless; further, the tree is a heavy and regular bearer.

The *Valentia Late* is a good late variety. The tree is a rapid grower and very prolific; the fruit is of excellent quality, and remains in good condition on the trees when other kinds are unobtainable.

The *Mediterranean Sweet* is another good late variety, but somewhat earlier than the *Valentia*. The size of the fruit is medium, but the quality is exceptionally fine. The rind is smooth and thin; the tree appears to have special drought-resisting qualities.



The *Jaffa* is a good mid-season orange, but it has a tendency to over-bear one season and under-bear for one or more succeeding years.

NAARTJES.—The term “naartje” is used in the local sense, and refers to what are known elsewhere as tangerines or mandarins. Naartjes, on the whole, require less care and attention than oranges; they are much better drought-resisters, and bear good crops where oranges are almost a complete failure. Further, they are less subject to the ravages of the orange codlin moth.

The loose-skinned varieties, such as the *Bombay*, are of excellent quality, but should be planted for local consumption only, as their carrying and keeping qualities are poor. A further drawback from which they suffer is a liability to the depredations of certain fruit-eating birds, which appear to have no difficulty in breaking open the brittle loosely-adhering rind. To this category belongs the *Satsuma*, which, although not the best of its class in other respects, possesses the advantage of being the first to ripen and the hardiest of all the citrus fruits. The tree is of a spreading, willowy dwarf habit, and may be planted in places where it is too cold for other kinds of citrus trees.

Of the varieties with closely adhering rind, the ordinary Cape and Natal seedlings are of the foremost. To this class also belongs the *Dancy*. This tree is a vigorous grower, and very prolific; the fruit, which is of a deep orange colour, is of medium size but excellent quality.

The *Emperor* is another good variety. It is somewhat coarser than the *Dancy*, but the fruit is large and of a good flavour.

LEMONS.—Lemons, except perhaps the Mazoe seedling, are more subject to the effect of cold than oranges or naartjes, but suffer much less from drought than oranges. The writer's chief experience has been with the *Eureka* and *Villa Franca* varieties. The *Eureka* is semi-dwarf in its habit, and almost free from thorns. The quality of the fruit is of the very best, and is an excellent keeper. The tree is, however, very poorly covered with foliage, and, as a consequence, is liable to sunburn.







The *Villa Franca* is a vigorous grower and very prolific; the fruit, although a little coarser than that of the Eureka, is of good quality. Specimens grown by the writer were regarded in Covent Garden market as of the best that had ever been seen there. This variety is recommended for general planting.

GRAPE FRUIT.—*Pomelo* appears to be the proper horticultural name for this fruit, but commercially it is known as *Grape Fruit*, a name attributable to the grape-like clusters in which the fruit is borne on the trees. It is not so many years ago that this fruit was considered worthless and hardly known; but it has now become the breakfast fruit *par excellence* in America and is rapidly gaining in favour in the Old World. Apart from its peculiar and pleasing flavour, physicians have discovered that it is most healthgiving and possesses tonic properties all its own; as an appetiser it has no equal.

The writer has experimented with several varieties, but so far has found none to surpass the *Marsh's Seedless*. This is strictly a misnomer, as the fruits contain, as a rule, three to six seeds each; on the other hand, the name is, to a certain degree, merited in contra-distinction to all other varieties, which, on the whole, are very full of seeds.

The grape fruit, in addition to its ordinary uses, makes an excellent preserve.

In the foregoing remarks I have confined myself to personal experience with varieties extending over a considerable number of years. I have, however, under observation many varieties of citrus fruits imported from various quarters of the globe. As already indicated, one of these, a navel orange, promises to far surpass the Washington Navel; and it may be added in this connection that in the country of its origin, Florida, the Washington Navel has not proved a success. I am not aware that there is any great similarity between the conditions in Florida and Southern Rhodesia, but I have found that many varieties of the fruit trees, especially peaches, which flourish in Florida are a success here. Of other importations certain varieties of oranges and grape fruit from Florida are especially promising, and here may be mentioned the *Kumquat*, a fruit, as far as I can ascertain, new to South Africa.

The *Kumquat* is the smallest of the citrus fruits. The tree is rather in the nature of a bush; the leaves are small and of a very dark green colour. The fruit is carried in abundance, and rarely exceeds one inch in diameter. It may be eaten raw, rind and all, and has a very pleasant flavour. It makes excellent jelly and marmalade, and can be crystallised and preserved whole. The Chinese use it extensively as a preserve.

**INSECT PESTS AND DISEASES.**—In all citrus-growing countries a continuous war is being waged against insect pests and diseases. California has many varieties of scale insects, and Florida has its White Fly and several fungus and physiological diseases. So far Rhodesia is comparatively free from injurious insects and diseases, although in some places the *red scale* is very destructive. Some years ago the writer's grove was badly infested with this pest; spraying was of little value, and the costly system of fumigation was resorted to. This, if carried out carefully, is very effective, but complete eradication cannot be hoped for. Of recent years some parasite or fungus enemy of the red scale has established itself in the trees and keeps the scale completely in check. Occasionally a tree becomes badly infected, but it is no longer a source of anxiety, as the enemy soon gets the upper hand. As red scale is the *bête noir* of citrus growers in South Africa, the above experience is commended to the study of the local entomologists. A number of young trees have from time to time become infested with a soft brown scale, which is also to be found on many other indigenous plants. This scale yields readily to treatment by the ordinary washes and sprays; if neglected it carries in its train a sooty deposit, the result of excretions from the scale insects, which interferes with the natural functions of the foliage and retards the growth of the trees.

The Australian bug makes its appearance at intervals, but is kept effectively in check by its natural enemies.

In past years occasional specimens of early ripening varieties of orange have been found to contain a maggot, the larva of the orange codlin moth; hitherto it has shewn no great tendency to increase, but in the present season it has spread by leaps and bounds in the writer's grove, and it appears that

in some districts the loss from this cause has been over 50 per cent. It is understood that this pest is receiving the careful attention of the Government Entomologist.

As something of a pioneer in citrus growing, I have made many mistakes, yet am quite satisfied that the country is exceptionally fitted for citrus growing. Naturally an export trade must be built up; for this our fruit is suited on account of its good keeping and carrying qualities, the result of ripening at a time when there is no rain and but little moisture in the atmosphere. So far I have seen no farm on which some site is not fit for a citrus plantation, and if each farmer devoted the comparatively little time and expense necessary to establishing a grove of from, say, three to five acres of good varieties, the foundations necessary for a profitable co-operative export trade would thereby be laid. In conclusion, the necessity of unremitting attention to the trees is insisted upon; ten trees well looked after are more profitable than one hundred neglected.



## Agricultural Statistics Ordinance.

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A measure of very considerable importance to farmers and the country at large is the Agricultural Statistics Ordinance which was introduced during the recent session of the Legislative Council. In moving the second reading of the Ordinance, the Director of Agriculture said the introduction of that proposal marked a stage in the progress of agriculture in Southern Rhodesia, a transition from the pioneer condition to one of advanced agricultural development, and removed the production of crops and stock from the region of speculation to one of ordinary commercial concern. That proposal was the direct outcome of the initiative of the Farmers' Congress. In past years they had discussed the subject at the annual gatherings, and in 1913 certain proposals were made for the collection of voluntary statistics. It was proposed that every association should furnish through its members complete statistics to be published through the Department of Agriculture. That attempt was, unfortunately, a complete failure. However, at their last gathering at Bulawayo, on the resolution of the present chairman, Mr. Wilson, the Congress carried a resolution to the effect that the Government be asked to undertake the formation of a Statistical Bureau, more especially to deal with agricultural produce and live stock, and that legislation be enacted rendering returns by farmers compulsory. He would commend the discussion of that matter in the Congress to the close attention of hon. members, because there was not a dissentient voice to the proposals. The feeling of the Congress was unanimous, and not only enthusiastic, but positively hot on the subject. The voluntary system was condemned, there having been a small trial of it to which he would specially refer. Attempts were made in the Umtali district and at Gwelo to obtain some returns, but they were so incomplete as to be altogether valueless. However, that did go to prove that certain associations, even before the discussion at the Farmers' Congress, did make efforts in that direction, and it shewed that certain people at least were prepared to carry the proposals into effect.

In the discussion at the Congress, and in subsequent consideration, certain principles in connection with the subject had evolved to which he would briefly allude. Those were compulsion, secrecy, simplicity and promptitude. It appeared that their voluntary system failed because the returns obtained by that means could not possibly be complete, and when he said complete he would explain to the House that he meant complete so far as any particular fact was required, such as the number of stock in the country—that it was not fully comprehensive of all the stock in the country. He did not mean that complete returns of all descriptions should be obtained. Under the voluntary system it was impossible to say what proportion of people did not furnish returns, and whether those who did not furnish returns were the largest producers, or unimportant producers, or producers at all. So they had no means of forming an estimate for the correction of such failure. If 10 per cent. of the persons concerned did not furnish statistics, there was no indication to the country that the crop or the number of cattle, or whatever the data might be, should be increased by one-tenth. Therefore, under the voluntary system all the effort and the labour of what might be the majority of the people might be nullified by the neglect of one or two, or of a small minority, to furnish those statistics. For those reasons compulsion was absolutely essential, but at the same time he thought they would realise that compulsion was quite impossible unless they had the general public unanimous, as in this case he was able to assure the Council existed. He was assured of the moral support of the Agricultural Union and of its whole-hearted co-operation in the matter. Compulsion did not necessarily mean anything burdensome on the people, and it was realised that it would be the duty of the Government to make that compulsion as little irksome as might be. Secrecy was also an essential to ensure the confidence and support of the farmers furnishing the statistics, because the support of the people was half the battle in a matter of this sort. Confidential treatment of statistics was provided for all the world over, and he would like to quote from the headings of statistical returns of the United Kingdom on which it was inscribed that “returns are not connected in any way with taxation, but are required solely for the purpose of obtaining statistical information respecting agriculture in Great



Britain." And again on the same forms they read "that the returns of individual occupiers will be considered strictly private and will not be published." That he regarded as essential and expedient, and as almost going without saying. However, that matter had been occasionally raised, and it was as well to allay suspicions at the very outset. It was not intended to publish figures relating to any one individual, but the aggregate for any particular crop throughout Rhodesia, or the aggregate of each district of Rhodesia, and naturally the grand totals for the country. Also he would emphasise the point that those returns were purely agricultural, and they excluded all data relating to private matters, personal affairs, such as income or family life. (Laughter.) That suggestion appeared to amuse the House, but he could assure the House that in some countries returns on those subjects were demanded. To make a success of it, it must be as simple as possible, both as regarded the Government and the people. The system must involve the minimum trouble to the individual. He must be merely asked to fill in certain facts on a form which was supplied to him, to gum up the envelope and to post it back. The returns in the beginning would be few, but so far as they went he thought it would be well to make them full and complete, so that in time to come, as the different data increased in complexity, the initial figures would be still perfectly suitable for comparison with later returns. From the outset such returns as they did collect must be complete in themselves. Finally, the great desideratum in handling that matter was despatch and promptitude. Certain statistics collected were but of transient value, of great importance at the moment, but they very soon lost that importance. That was especially so in returns relating to prospects of crops and the harvest. The information must be provided at a particular time, and they must have the simultaneous despatch of the forms to all people all over the country, and they must have their immediate completion and return within a prescribed time, and after that the compilation must be as rapid as possible. For that purpose an adequate staff would be necessary to deal with the figures in a few weeks' or a few days' time. Finally, they required to give wide publication of the information.



He wanted to urge the vital importance of those matters on all classes of the country and the Government, the producer, the commercial community and the consumers. It would be noticed that, valuable as such figures were at the time of publication, they gained cumulative value as the years went on, and the returns of any one year could be compared with another.

The informative value to the country of such statistics would be immense. They would explain to the public first the condition of the nation as a whole; they enabled them to compare themselves with other countries at different periods in their progress; they enabled them to compare one district with another and one branch of the agricultural industry with another. So in that way they would be able to get at the rate of progress of the country.

The advantage of statistics to the producer lay mainly in this, that they indicated to them what the supplies in the country were and what markets they could most advantageously sell their products in, and in giving the producers the idea of the supplies it naturally guided them as to what price they should ask for, and so forth. But the chief value to the producer lay in the forecasts of probable crops anticipated during the next few months. Those forecasts were only to be based upon estimates framed from reports gained from time to time and from comparison with previous years under similar conditions. For that reason the statistics for past years helped enormously in framing estimates for the future. The Ordinance provided for the collection of those estimates.

The value to the Government was obvious. It enabled the Government to know the wealth of the nation, and to ascertain where help was particularly required in any branch of industry. It also helped the Government to prepare in advance for prospective development, for example, in such matters as the exportation of grain or precautions for an approaching famine, or for the opening up of overseas markets for the surpluses of tobacco, oranges, meat and dairy products and the like, and to the Agricultural Department in particular it indicated the directions demanding special encouragement and support. It was not only for the benefit

of the agricultural community. Naturally the commercial man gained much knowledge of the produce of the country, and he learned what could be expected within the country, and what it would, therefore, be necessary to import from a distance. It would particularly assist and guide co-operative undertakings of farmers in the country, such as tobacco co-operative societies, and maize co-operative societies, and organisations of that sort. Moreover, it helped the railways in warning them of the requirements of the country in advance and of the probable needs of transport. Those statistics would also be a great guide to their large consumers of foodstuffs, such as the employers of labour, notably the mines, and it would give invaluable help to their budding industries in commodities such as butter, bacon, beer and oil.

Their Customs figures only gave them some idea of the imports and the exports, but they gave no indication whatever of the local production or the local stocks in hand in the country at any time, or the local powers of production. Their want of knowledge in that respect led to a great deal of commercial extravagance, because at one time they were exporting and at another time they were importing the same article during the year. From one end of the country it was going out, and at the other end of the country it was coming in, and that had been notably the case with maize. He had some figures before him which were alarming, because he found that whilst the exports of maize had been steadily growing for a number of years, the imports had also been growing. In six years out of seven Rhodesia imported more of its staple crop of maize than it had exported. In only one year was the export in excess of their import, and yet with those figures before them they did not know what their total production in that respect was, and what they were likely to get even in the present year. The variation of their imports had been enormous, too. Figures shewed that they had varied during seven years between 918 tons up to 13,588 tons, whilst their exports during the same period had varied from 13 tons up to 5,149 tons. The fluctuation was far too great, and it shewed a great and unnecessary buying and selling and the superfluous transportation of maize over the country, which all added to the ultimate cost to the consumer. In that connection he found that even in the Union of South Africa last year the lack



of knowledge of the crops led to the re-importation of 30,000 bags of South African maize. That had been exported once from the Union, and it came back, quite apart from the importations from the Argentine and elsewhere. They had brought in 30,000 bags which they themselves had exported earlier in the season. That was unavoidable without statistics. With statistics, in a large measure the difficulties could be overcome. Those figures before him unfortunately furnished him with no guide as to their own production. Similarly in the case of cattle. Cattle were probably the chief agricultural line that they possessed, and their future was based on the prosperity of the cattle industry. The census of 1911 told him that there were in the country 463,923 head of cattle, and the latest conservative estimates they had framed gave the figure at about 600,000. But they had no reliable idea of the number of small stock in the country or of other forms. He had alluded to those matters in the annual report of the Department of Agriculture, so he would not take up the time of the Council now in referring to them.

With regard to the methods proposed in the Ordinance, he would say that it was purely a business matter, and four different steps would be necessary. The first step would be the preparation of the full list of the farmers in the country, and that list would afterwards have to be kept up to date. Farmers were obtaining land from many sources, from the British South Africa Company, from the large companies, from one another and from private individuals who owned land, and it was therefore not possible from their present records to compile an accurate list of the farmers in the country. That was the first essential, and when it was done it would have to be maintained. Then to those farmers they would have to issue a form for them to fill in, sign, seal and return to the statistical office. Those forms having been collected, it would be necessary to ensure that defaulters were brought up to a sense of their duty, and while there were powers in the Ordinance to prosecute, it was hoped that that would be largely avoided by a feeling of mutual good will, and an intimate touch between the statistical officers and farmers, and it was here that one looked to the good offices of the various farmers' associations throughout the country. It must be realised that the furnishing of statistics was a public service, and it would be regarded



in that way. Then, having been collected, those statistics must be collated, prepared and published as widely and promptly as possible. As stated, it was suggested they should commence simply and extend later, but so far as they went all the figures in the first place collected should be as perfect as possible, so as to be comparable with the same returns furnished in future years. On these matters the Executive of the Agricultural Union had been consulted. They suggested if statistics were collected relating to live stock, maize and tobacco, in the first instance, they could leave other things until later. Facts were particularly required in regard to live stock, the total number of cattle, horses, mules, sheep, goats, poultry and ostriches, leaving the differentiation as to sex, classes and the like until later. They merely wanted an enumeration in the first instance. The next step which should be taken at once was to get a return of the deaths during the year previous to the return being furnished, and indicating wherever possible the cause of death. They wanted a collection of the total sales of animal products, live stock, wool, butter, cream, milk, eggs and even feathers. Those suggestions were a great simplification of what was obtained in other countries. With regard to crops, it would probably be sufficient to obtain the acreage, and the yield and the quantity sold, because the quantity sold is not all the farmer grew, and they wanted to know what the country was producing altogether. As regarded crops, it is only suggested that they should deal with maize and tobacco in the first instance. Further and separately from that, estimates would be obtained possibly at a different season of the year to the remainder of the statistics as to the prospects of the year, and on those estimates forecasts would be framed. The totals could only be prepared by the compilation from a large number of individual figures, and it was for that reason that they must realise the importance of each individual's share in the work. There was no end to the nature of statistics which might ultimately be asked for, but it would be sufficient to begin very simply, but completely as far as they went, and later on expand as the circumstances of the country might shew to be necessary. The scope of the proposals in the Ordinance would include agricultural returns in the wide sense, live stock and crops, data relating to land tenure and to all the industries auxiliary to agriculture, but not to go beyond the realm of agriculture.

Hon. members might ask for a precedent for those proposals. In reply he would explain that Government crop reporting was general throughout the civilised world. It existed in every country in Europe, with the exception of Turkey; throughout the United States and Canada, Argentina, Chili and Uruguay in South America, the Australian States and New Zealand, and in Africa, statistics were collected in Egypt, in Tunis and in Algeria. There was nothing new in the proposal, because he found since 1815 systematic returns had been annually collected in France. They began with wheat, and they had expanded until they had an elaborate State undertaking. Hungary had a very splendid organisation, being, as it was, such an important agricultural community, and in that respect it was a model to the rest of the world. In Hungary these data had been collected for the last forty years, since 1874. America claimed to be the country where the collection of agricultural statistics was most advanced, and they had been collecting statistics since 1866; but the system in the United Kingdom was the one which would perhaps appeal to hon. members most. There they had returns also dating back to the year 1866. Great Britain was divided into 60 areas called "collections," and he took it that Rhodesia would correspond to one such collection. The Government officers of the Board of Trade distribute by post annually over 500,000 forms throughout the British Isles to all owners of more than one acre of land, and to all stock owners. Those schedules were filled in by a certain date and returned. Reminders were sent by post, and there were powers for punishing men who failed to supply such data, but in England at the present time returns were made in 97 per cent. of the total schedules issued. The State then, with great expedition, compiled those statistics, tabled them, and summarised them, and published them all over the country. In South Africa they must admit that no systematic collection had, as yet, been made of this nature, but the need was recognised by the Government of the Union of South Africa, as it was by their own Government and the public. The general opinion had been briefly and succinctly stated by the President of the Landowners' Association in his report for the year 1913, from which he would quote the following words because they shewed the South African view:—



“ Your Committee has for years advocated the necessity for the collection of agricultural statistics, but it does not consider any good purpose can be served by the compilation of statistics voluntarily rendered. It realises that the matter becomes one of greater importance as the time approaches when the country must export its surplus produce. It appears that the longer the matter is delayed the greater will be the expense attached to the difficulties of organisation. It fully realises the difficulties of collecting reliable data in the Union, even in legislative centres, and recognises that it will take some years to organise a complete and satisfactory system. It desires to point out that it would be difficult to find any other country in the world of the status of the Union to which the collection of such data is of more importance, and where so little is done. Your committee considers that sufficient attention has not been given in the past to the importance of agricultural statistical returns, and it desires strongly to urge on the Government the necessity for passing the proposed statistical Bill during the current session, and bringing it into operation at the earliest possible moment.”

The Government of the Union was, as stated, seriously considering the question of the introduction of legislation of that description. Immediately after attending the Farmers' Congress he was fortunate to have the opportunity of consulting with the Director of Agriculture for the Union and the Secretary for the Interior on the subject, and he must express his indebtedness to those gentlemen for much valuable assistance in the preparation of the Ordinance. They had given him the most practical help possible. It appeared that in the last session of the Union Parliament a Bill of that nature was introduced, giving power to the Governor General to frame regulations for the purpose of collecting vital statistics not only agriculturally but also industrially and commercially, and so on. That Bill, however, was one of the innocents which were slaughtered at the end of the session, and the only criticism offered to it in the House was that it left too much to regulations to accomplish. That had been avoided in the draft



Ordinance before that Council. He would like to quote briefly from the annual report of the Director of Agriculture for the Union of South Africa for the year 1913. He said:—

“Agricultural statistics are still lacking, but the Government has decided to maintain a permanent census office in the Department of the Interior, which will include among its functions the collection and publication of statistics of production and estimates of the condition and yield of the principal crops. In order to obtain the latest information on the subject, Mr. Moffat, the Director of Census, was sent to Europe and to the United States of America and Canada to study the methods of obtaining and publishing agricultural statistics in vogue in those countries, and he attended the bi-annual conference of representatives of contributing countries at the International Institute of Agriculture in Rome.”

As the result of Mr. Moffat's special investigations on behalf of the Union Government he (the speaker) had been furnished with the fullest information, and the Union's proposals were framed on Mr. Moffat's reports and on the recommendations which might be regarded as the latest and most expert information available on the subject in the world. The Ordinance that he was now bringing before the House was the direct outcome of those reports and that information, and their law was frankly modelled on the draft proposals of the Union. But whilst he said that, and admitted the assistance that that fact was to him in moving the matter before the Council, he must point out that it was not precisely the same as the Union recommendations would be, but it was adapted to their peculiar conditions and requirements and the circumstances of the country. That Bill was much more limited in its scope, and restricted to agricultural matters. One of the reasons for that was that in Rhodesia at the present time, under the mining law they collected very complete data in regard to that industry. They also collected vital statistics, Customs, and trade returns and meteorological returns, and even educational statistics, but there was nothing analogous in regard to agriculture, and it was for that reason that he asked the House to give the

Ordinance careful consideration and to examine it fully in order that they might enact a law which would really be of the utmost use to Rhodesia. He moved the second reading.

Mr. Edmonds, in congratulating the Director of Agriculture on the able way in which he had introduced the Bill, said he would call attention of hon. members to what he thought was a very vital fact in connection with the subject. That was that whilst they recognised, generally for a good many years, that the statistics were vitally necessary, it was only quite lately, within the last year or two, that such a prickly part of the community as the farmers were, had universally desired that compulsory measures should be taken in order to collect satisfactory statistics to be in the hands of the Government. He thought that a great amount of credit was due to the Director of Agriculture for having done a great deal of spade work, which had led up to that happy consummation. He thought that most hon. members were aware of what had led up to that desire which was expressed at the last Congress of the Agricultural Union. It was that with the rapid growth of the mealie industry there had been a good deal of business in connection with that crop which had not been conducted in quite a satisfactory way, particularly to the mining industry, in this country on account of their not having exact figures in regard to the maize production. He knew that the Farmers' Mealie Co-operative Society, who had dealt with the bulk of the maize in the country, had been subjected to criticism, and to a great deal of undeserved criticism, at the hands of the mines. He believed that their desire recently expressed for those compulsory statistics was to enable them to deal in a more satisfactory way with the product which they were handling. They also realised, so far as the local demands at the present time were concerned for maize, that production was about equal, and in some years had exceeded the demand. In order to get at the exact requirements of the country before proceeding to supply an export trade, it was absolutely necessary to have a measure of the sort proposed whereby the exact figures would be obtainable. He was pleased to hear from the Director of Agriculture that it was not proposed to apply the measure except in a restricted way with regard to obtaining information with regard to maize, tobacco and live stock. He was further pleased to hear the hon. member make the sug-



gestion with regard to the method of collecting the information. If it was necessary at a future date to employ officials to visit the farms in connection with the obtaining of those statistics, he suggested that very great care should be exercised in choosing the official to be sent. He understood the Director of Agriculture to say that a gummed envelope at present would be the only necessary machinery to obtain the information required under the Ordinance. He was particularly glad to see embodied in the Bill, in clause 3, sub-section 2, that particulars might relate to estimates of probable production as well as to actual facts and figures. He thought that was an important matter, although it might be impossible, about half way through the mealie season, for people with any certainty to state what the crop in the district or the country might be. Yet, certainly some time before the actual reaping took place it would be possible to know fairly accurately what the amount of production might really amount to. Moreover, he thought it was important to get those particulars because it would put a stop to something in the nature of the gambling element amongst the farmers themselves. It was owing to the imperfection of the information supplied to them that many farmers did not know whether to sell their crop for 10s. or for £1 at the beginning of the season. He thought that the Bill would stop that sort of gambling. He said that the Union had not proceeded with their Bill so far as they knew, and he congratulated the Director of Agriculture on once again having got ahead of the Union. When they went into Committee he would have some suggestions to make in regard to the various clauses in the Ordinance. At present he would confine himself to congratulating the Director of Agriculture on the able way in which he had introduced the Bill.

Mr. Cripps said that there was no question whatsoever that the Director of Agriculture had made out a splendid case for the passing of the Ordinance, and he was sure that no member of the House could have heard the Director of Agriculture and have remained unconvinced as to the necessity of the Ordinance being placed on the Statute Book. It had been interesting to watch the way in which the hon. member had educated the farmers step by step towards feeling the necessity for legislation of the sort now introduced to the House. He could think back to the time in Salisbury when proposals were made



and the farmers were in a hypercritical mood in regard to them. At that time they had received the Director's advances with great suspicion. But the best way to educate the men was through their pockets, and he thought that the farmers had now come round, through their co-operative societies especially, to see the need for the introduction of some sort of method of collecting accurate statistics of the crops of this country. He could say in his district they had often felt the need for statistics, and they really did not know where they were as regards the production of the country and as to the probable price of mealies during the ensuing season. Now that they had various factories in their mind, such as bacon, oil, cream and butter factories, it was absolutely necessary that proper and reliable statistics should be available for their use. The farmers themselves need not feel that they were being specially selected to provide returns. The miners had submitted to it for years past, and they had supplied very accurate statistics, indeed, as regards their industry and their work, and he thought that the farmers need not resent any interference in their case. He had much pleasure in supporting the Ordinance.

Col. Grey thought, as the Director of Agriculture had said, that there was a real desire among the people who were working on the land to obtain reliable statistics in regard to their production. The old system, as the Director had pointed out, had failed entirely. It was natural that it should fail. It was impossible that it could be anything but a failure, and at last the farmers had decided that it was necessary that legislation should be applied towards obtaining the necessary statistics, and that there should be penalties for non-compliance with the law. He was somewhat opposed, however, to a particular part of the Ordinance, although with the main principles he was in accord. He thought they would have heard something more from the two hon. members who had previously spoken. He referred particularly to sub-section 2 of section 3, and to clauses 4, 5 and 6. Sub-section 2 of section 3 required the farmer to give an estimate of his probable production. Various reasons had been assigned for that, but he thought the more general reasons given, both by the Director of Agriculture and one hon. member on his (the speaker's) side of the House, shewed the necessity there was

for arriving at some idea of the maize production in order that a proper price might be fixed for the year. First of all, he asked was there any value in statistics to be obtained of that nature? He took it that the Director of Agriculture's records of facts, records of actual production, were compiled in all up-to-date countries for the purpose of arriving annually at the progress which was being made in the industries of the country. It did not seem that such a proposal to collect statistics, as regards the principal production, was of any value so far as those things were concerned. He took it that the collection of statistics, such as had been mentioned, the probable amounts of maize grown during the year, was the business of the co-operative society, or the trade institution engaged in that particular product. It was vital to a business, such as the Mealie Co-operative Society, or trade institution analogous to it, to obtain such statistics. Let them take the present year. Supposing the Director of Agriculture had issued his forms, upon which the principal production would have been entered, what would they have had? If he had issued those forms in the month of February he thought it was a fact that they would have proved to be entirely inaccurate and incorrect. There would probably have appeared on paper double the crop that would be reaped. He thought, therefore, it was much better in entering upon a measure such as that before the House, to insist only that statistics as facts should be obtained, in order that they might record annually the progress of the country and the progress of their industries. Again, in sections 4 and 5, it was provided that statistical officers should perambulate the country and ask questions in regard to all kinds of things, mainly, of course, connected with agriculture, and so forth. They had had the assurance of the Director of Agriculture that he would not enter into particulars in regard to the private income or the family life of the people of the country. He presumed that enquiries would not be made into the question of the farmer's dinner, or the ingredients of which it was composed. (Laughter.) He thought it was entirely unnecessary to send statistical officers around the country asking the farmers questions. What they required was statistics, the fact to be recorded on paper, which the producer had affirmed, and for which he could be held responsible. It would be an expensive matter to begin with, and he



believed it would be entirely unnecessary. He had only shortly outlined his objections to a certain small portion of the excellent measure which had been brought forward by the Director of Agriculture. He thought it would be welcomed by the whole country, and he hoped, with the exception of a little elimination here and there, the Ordinance would become law.

Mr. Mitchell thought the Ordinance ought to meet with the warm approval of the country. He did not agree with the hon. member for Salisbury District as to the effect of subsection 2 of section 3. He saw no harm whatever in getting an estimate of the probably yield; in fact, he thought it a wise proceeding. Let them look ahead as far as they could. They might be right, or they might be wrong, but they had to make arrangements sometimes in anticipation. So long as it was regarded as an estimate, liable to alteration, it was a wise thing to have that estimate, and as to the facts and figures, which were not in dispute at all, it would be a great convenience not only to the farmers, but to the consumers of the country, who would then have some reliable system informing them what there was in the country and what there was likely to be in it.

The Director of Agriculture said he would like to reply to one or two of the points that had been raised. He would say first, however, that he was very glad to see the reception accorded to the proposal coming both from agricultural members and from members whose interests lay away from farming. It was very satisfactory to see the approval of the principle, and to feel assured that the second reading would go through. He thought it was his duty to answer some of the difficulties that had been raised. He would like to do so in no spirit of carping criticism, or anything of that kind, because he quite realised that a Bill like the present required very careful consideration. He would be glad to receive suggestions from hon. members, not only in Committee, but, if possible, in advance, so that they might be considered before the House went into Committee. With regard to the remarks of the hon. member for Salisbury District, concerning subsection 2 of section 3, he thought that, perhaps, he had not made the matter quite clear. When he was dealing with the



position of statistics in other countries, he intended to say that universally the forecast of the estimate of crops aroused much more attention than the actual figures of the crops themselves gained some time after the harvest. Reports of previous years were often issued from twelve to fifteen months after the crops had been reaped, and were then not of very much use to the community. It was the estimates in the United States of America and Australia, regarding the staple commodity of wheat, which attracted great attention. Quite apart from the sporting element, who made bets on what the production would be, there was an enormous amount of interest attaching to the matter, and the records of the actual production were not nearly of the same value as the estimated figures to which he had referred. Co-operative societies and firms could only ascertain the prospects of the crops belonging to their members, or to their customers, and it was for the Government to collect the returns for the whole country. The partial returns at present obtained by the local co-operative society were useful so far as they went, but they gave no information as to the position of the whole country. They could not say that because a co-operative society had so many hundred members that the total crop of the country bore any relation to that number. He admitted that the hon. member's criticism was fair when he said that if last February they had issued an estimate of the crop of maize for this year they would have been totally wrong. That was so. But the principle underlying the question of calling for statistics was that one must ascertain the acreage sown of the crop, and by taking the average yield of that crop they got a rough idea of what they might expect. Then they would watch the crop and the weather, and upon that they could form an idea as to whether the crop was going to come up to the average or be below it, and if it was below, how far below. Then, in about the month of April or May they could circularise the farmers and ascertain what they anticipated reaping. Then they would know the position, and within a few weeks or days they could publish an announcement of the probable crop of the country. They would quite realise that estimates were subject to correction from time to time as they approached the harvesting season. He would like to allay fears of hon. members in regard to the intentions of section 5. It was quite

true that the interpretation that had been put upon it might be drawn; but he did not think it was the intention of the Ordinance that officials should perambulate the country and interrogate the farmers in regard to their crops. It was impossible, as to do so would mean the employment of an enormous staff, which was beyond their powers. It was, however, necessary that the prescribed officials should have the power to visit farms, where they doubted the facts, and verify them. It was mainly for the purpose of verification that those powers were provided. Then their officers should have the power to enter factories and workshops, such as the Gwelo butter factory or the proposed bacon factory, in order to see for themselves how things were going on. It was intended as a check on the statistics furnished in writing, and there was no intention to catechise the farmers of Rhodesia upon such subjects.

Mr. Begbie added his congratulations to those that had already been made to the Director of Agriculture. He would like to call attention to one or two things which might be considered to be of sufficient importance to be included in the measure. The Director of Agriculture had told them that he did not intend to include in agricultural productions other productions than maize and tobacco. He (the speaker) contended that there were other essential things, such as potatoes and oats, which were certainly worthy of inclusion in the Ordinance. He found that there was no allusion made in the Ordinance to arboriculture, which was a most important item, particularly in a country where timber was so extensively used. It would be a matter of interest to see what the farmers were doing in the direction of supplying the country with timber for the general purposes of the industries in the country.

The Director of Education said that as the Director of Agriculture was not in a position to reply further, he had asked him (the speaker) to state on his behalf that the maize production, citrus trees, and one or two things he had mentioned, would not be the only things ultimately to be included in the statistics. There was provision in the Ordinance for the other things he had mentioned. On his own behalf he would like to add, on the question of probable

statistics, that the matter was not nearly so difficult as the hon. member for the Salisbury District imagined. He thought that any farmer in the country would be prepared, almost at any time, to say what the probable yield was, at any particular date, of his farm. When that was taken in conjunction with the area that had been sown, as the Director of Agriculture had pointed out, a very accurate estimate could be obtained. Those statistics were very useful in other countries, and certainly they ought to be very useful in a young country like Rhodesia.

The second reading was passed.

The Ordinance passed through the Committee stage without amendment, and it may be hoped that it will come into operation in time to provide tangible evidence of its value in connection with the next year's harvests and the furnishing of reliable information in regard to live stock.



## How to Cure Hides and Skins.

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By B. ROSENTHAL (Rhodesian Export Company, Salisbury).

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There is an old saying, "If a thing is worth doing, it is worth doing well," and this applies particularly to the curing of hides and skins.

In a country like Rhodesia, where nearly every farm is stocked with cattle, sheep or goats, it is surprising, from the writer's experience, how very little knowledge the average farmer has of the treatment of hides and skins, and it is his intention to try and bring home to all interested, by means of this article, that by a little care and a minimum of expense, considerable benefit will accrue to the farmer if he carries out the following advice.

The material to employ is a very ordinary one, namely, medium or coarse salt. In the first place, the slaughterer should be most careful not to cut the skin, and to take it off the carcase as evenly as possible—a cut or cuts depreciating the value to a very great extent. At the same time care should be taken to keep both sides of the skin clean.

Immediately the hide or skin is taken off the animal, it should be opened up and well salted; by this I mean that the salt should be evenly distributed and rubbed well into same. It should then be folded once from neck to tail, care being taken that no part of the flesh side is exposed, and allowed to remain so for two or three days. Any superfluous salt should then be taken off and the hide or skin put out to dry, flesh side uppermost. To achieve this drying successfully, the hide or skin should be opened up in a shady place, for a skin dried in intense heat makes it what is known as "sun-burnt," and by the trade is classed as damaged, being easily torn. On no account should hides or skins be pegged out to dry, but

just laid flat. The skin is now ready for market, and until disposed of should be kept in a dry place.

Hides should always be folded hair inside; if the reverse is done, the grain is damaged in rough transit.

It will always pay better to cure with clean salt, no matter what the cost, for the increased profit will more than repay.

When salt is unobtainable, the next best thing to do, in connection with *hides* only, is to wind-dry them over beams or poles in the shade, but whenever it is possible to procure salt, I do not recommend the above course, because such hides breed moth and grub very quickly, which soon destroy them. It should be borne in mind that to wind-dry a sheep or goat skin renders it practically useless.

Natives should not be allowed to lie on skins, as they are apt to become "brayed," the substance being taken out of them and so depreciating the value considerably.

Good hides and skins always have a value, and for these a ready market can at any time be found in Salisbury. The word "hide" is used as applying to the skin from a cow or ox, the word "skin" meaning that from a sheep or goat.

The writer will be pleased to answer any queries.

## Sunflower Cultivation.

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By H. GODFREY MUNDY, F.L.S., Government Agriculturist  
and Botanist.

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The common sunflower (*Helianthus annuus*) has been grown on a small scale in Rhodesia for several years, but the market for sunflower seed thus far has been limited, the seed being chiefly used by poultry keepers and occasionally for mule or cattle feed. With the establishment of a local oil mill this product may be expected to sell readily to the factory at a remunerative price to the producer, and the plant, therefore, at once assumes a position of greater importance in our category of Rhodesian crops.

The sunflower is a native of America, and was introduced into Europe about the sixteenth century, attention being drawn to it owing to the fact that the American Indians cultivated it for the seed, which they used both as food and as a source of oil. Russia was amongst the first of the European countries to devote serious attention to the sunflower as a farm crop, and it is now grown there very extensively both for its oil and as a raw food product, which is utilised in the same manner as the pea-nut in the United States of America. It also figures as a farm crop in India, Hungary, China and Egypt, and is extensively imported into Great Britain.

Sunflower seed oil in commerce is used for a variety of purposes, excepting that of lubrication. The cold pressed oil is of high quality, and can be utilised for culinary purposes, being indeed deemed equal to olive or almond oil. The second pressing, or "warm-pressing," yields an oil useful for lighting



purposes, in wool-dressing, and in the manufacture of paints, but most important of all, in the making of soap and candles. The average content of oil in the whole seed ranges from 15 to 28 per cent., and the ground seed and residual sunflower cake are extensively used in the manufacture of condition powders, stock foods and patent cattle cakes. Appended is an analysis of locally-grown sunflower seed made by the Agricultural Chemist, and it may be added that well-matured seed usually contains four to five times as much fat as maize, and a higher percentage of protein than any other cereal grain; indeed, in protein content it compares well with the pulse crops, such as beans and peas.

#### ANALYSIS OF STRIPED SUNFLOWER SEED GROWN IN MAZOE.

##### *Analysis of Whole Seed:—*

|  | Per Cent. |
|--|-----------|
| Water ... ..                           | 6.53      |
| Oil (ether extract) ... ..             | 21.49     |
| Protein (total nitrogen x 6.25) ... .. | 18.48     |
| Carbohydrates ... ..                   | 23.09     |
| Fibre ... ..                           | 27.89     |
| Ash ... ..                             | 2.52      |
|  | <hr/>     |
|  | 100.00    |

##### *Proportion of Husks to Kernels:—*

|                | Per Cent. |
|----------------|-----------|
| Husks ... ..   | 45.22     |
| Kernels ... .. | 54.78     |
|                | <hr/>     |
|                | 100.00    |

In composition the sample compared very favourably with the sunflower seed produced in Russia, Hungary, India and China, which are the chief sources of this seed for oil-yielding purposes. Hungarian seed consists of 45 to 52 per cent. kernels and 48 to 55 per cent. husks, the kernels containing 36.6 to 53 per cent of oil. The oil content of kernels obtained from the sample under examination was 39.2 per cent.

## COMPOSITION OF SUNFLOWER SEED CAKE.

|                            | Per Cent. |
|----------------------------|-----------|
| Water ... ..               | 10.8      |
| Oil (ether extract) ... .. | 9.1       |
| Protein ... ..             | 32.8      |
| Carbohydrates ... ..       | 27.1      |
| Fibre ... ..               | 13.5      |
| Ash ... ..                 | 6.7       |
|                            | <hr/>     |
|                            | 100.0     |

Sunflower cake pure is very little used in England, and seldom quoted on the London market. It is largely in vogue for feeding in Denmark and Sweden, where the ruling price generally lies between that of linseed cake and cotton cake. The Mark Lane quotation for sunflower seed during April, 1914, was 13s. to 15s. per cwt. (112 lbs.).

From the above remarks some idea may be formed of the value of sunflower seed in commerce, and the place which it may fill in the feeding and fattening of all classes of farm live stock.

The sunflower plant appears greatly similar to the maize plant in respect to its climatic and seasonal requirements. It gives usually the best yield of seed on land which will return heavy crops of maize, and any good maize soil is suitable. Experience in the United States of America, however, has shewn that the heaviest yields are secured from soils rich in humus and nitrogen, and this is to be expected, since a crop so rich in protein is likely to exhaust the soil of available nitrogen compounds. Practical experience in Rhodesia tends to prove that sunflowers can be grown with reasonable success on all our soils, whether heavy or light, but that the best yields are obtained on the red loams or black vleis. The crop requires a growing period of about 4-5 months, but some varieties, as, for instance, the "black seeded," are later than others. While the plant has been grown only on a small scale for poultry feed, there has been a tendency to plant late in the season, and this appears not infrequently to result in the crop suffering from lack of moisture and the seeds failing to fill. When grown on a commercial scale, therefore, seed should be planted





Striped Russian Sunflower. Sown 13th December, 1913; photographed 6th May, 1914.



Black Seeded Sunflower. Sown 13th December, 1913; photographed 6th May, 1914.





between the middle and the end of December. Seeding is similar to that for maize, namely, rows about 3 feet apart and plants about 12 to 15 inches distant in the drills. Six to ten pounds of seed is required per acre, and this can usually be drilled in with an ordinary maize planter. As a rule it is preferable, in order to insure a good stand, to drop the seed 3 to 4 inches apart in the drills and later to hoe out to the required distance.

Subsequent cultivation after seeding is similar in all respects to that for maize, except that the sunflower plant does not produce suckers. On the other hand, there are always a certain number of plants which, instead of producing one large head as appears desirable, tend to branch out and to produce numerous small flowering heads. Where this occurs, it seems desirable to remove all but two or three of the best heads, so that these may be the better nourished.

The heads should be cut off a few days before they are quite ripe, as when fully matured the seeds are apt to scatter. After cutting, the heads should be left on a drying floor for a week or two, and should then be sufficiently dry to shell. At this stage we meet the first and only serious difficulty in sunflower cultivation, namely, the threshing. There appears to be no really expeditious or economical method of shelling. No threshing machinery seems to be on the market, and the usual method employed is the flail or a rotary wheel. The latter can be recommended, and several Rhodesian farmers have adopted the hind wheel of a bicycle for the purpose. The wheel is turned by means of the pedal crank and the chain, and the dry heads are held against the rapidly revolving spokes. Needless to say, this treatment is not beneficial to the bicycle, but there are plenty of damaged machines in the country available for the purpose, or a special device of greater strength but made on the same plan would not be a costly investment.

As regards yield per acre, the average in the United States of America appears to be from 1,000 to 1,500 lbs. per acre. Variety trials conducted on the Botanical Experiment Station, Salisbury, during the past two seasons, and on the poorest soil available there, resulted in yields of about 800 lbs. clean seed per acre. The present season's crop is not yet reaped at the time of writing, but from appearances should

well exceed this yield. From Mazoe reports have been received of 1,500 to 2,000 lbs. of seed per acre, and in the Cape Province it is stated that over 3,000 lbs. of seed have been reaped from one acre. The American average of 1,000 to 1,500 lbs. per acre is, therefore, likely to prove a reasonable estimate for Rhodesia.

The dry stalk after reaping is too coarse and fibrous to be of any great value for feeding. It is frequently used for fuel, but in Rhodesia, where firewood is usually plentiful, will not greatly commend itself for this purpose. It does, however, contain a considerable amount of potash, and if collected and burnt, the resulting ash is likely to form a useful adjunct to the farm fertilisers. The ripe dry stalks make excellent sticks for hanging tobacco leaf in the curing barn. It is also claimed that the stems have proved an excellent material for paper making, but this is, of course, dependent upon the proximity of paper mills.

The green stalks are sometimes utilised in silage, but, beyond adding bulk, have comparatively little to recommend them. The heads containing the seed, and just before ripening, are of considerable value, and may be used in the silo with advantage, though they are somewhat difficult to pass through the cutter, and if not handled with care are apt to clog the machine. The Robertson silage mixture, originated in the United States of America, consists of a combination of maize, sunflower and beans—the proportion being one half acre of sunflower heads to 2 acres of maize and broad beans. In this country, the mixed crop might well be composed of maize and velvet beans. It is claimed that by using the above mixture, instead of ordinary silage, a saving in the daily ration of about 4 lbs. of grain per diem can be achieved with equally beneficial effects to the live stock.



## Note on the Treatment of Biliary Fever of the Horse with Trypan Blue.

By LL. E. W. BEVAN, M.R.C.V.S., Government Veterinary Bacteriologist, Southern Rhodesia.

(This note was written in 1913, but has not previously been published.)

Since the onset of the rainy season a number of cases of biliary fever have occurred among horses in the Salisbury district; Southern Rhodesia. Strangely enough, some of the affected animals have been horses which have been in the country several years, and, according to the general opinion, should have become "salted," since it is known from the appearance of the disease among newly arrived horses, mules and donkeys that the infection is endemic in the district.

Some of these cases were treated with trypan blue, with results so unfavourable that it was thought desirable to closely study the following case, with a view to determining whether this drug had any specific effect upon the parasites of biliary fever comparable to its action upon the parasites of malignant jaundice in dogs and redwater in cattle.

The subject was an aged bay mare, for several years the property of Sir Thomas Scanlen. As far as can be ascertained, she was a New Zealand bred animal, purchased by a local dealer in Johannesburg, and had been in Salisbury for the past seven years. During the first four years at different times she had been allowed to graze, but, when she presented her owner with a foal, this practice was discontinued. During the last year she had changed hands, and had at different times been allowed to graze. It is said that every summer she suffered from more or less severe attacks of biliousness.

On 5th February, 1913, she was sent to the laboratory for treatment. On examination of her mucous membranes, it was at once realised that she was suffering from "biliary fever."

Her temperature was found to be  $103.5^{\circ}$  F. Blood smears were taken from the ear, and on microscopic examination as many as 20 per cent. of red-blood-cells were found to contain parasites, probably *Nuttallia equi* (Laveran). The mare was badly tucked up, but was not unwilling to feed.

100 cc. of a  $1\frac{1}{2}$  per cent. solution of trypan blue at blood temperature was slowly injected into the jugular vein. The immediate effect of the drug was to produce a copious sweat. During the next hour large quantities of coffee-coloured urine were passed.

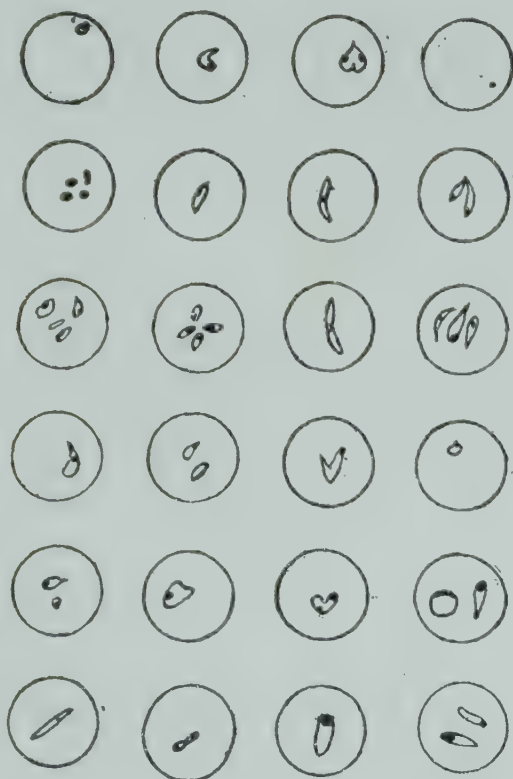
On the following day, blood smears were again taken, and it was found that as many as 25 per cent. of red-blood-cells contained parasites. The yellow colour of the mucous membranes was masked by the trypan blue. The urine was still dark in colour, and of a brownish green tint.

In view of the failure of the drug, a further 150 cc. of the same solution was injected, with the result that on the following day a slight decrease in the number of infected cells (13 per cent.) was met with. This decline did not continue, and the mare daily grew weaker and more emaciated and died on the tenth day after admission.

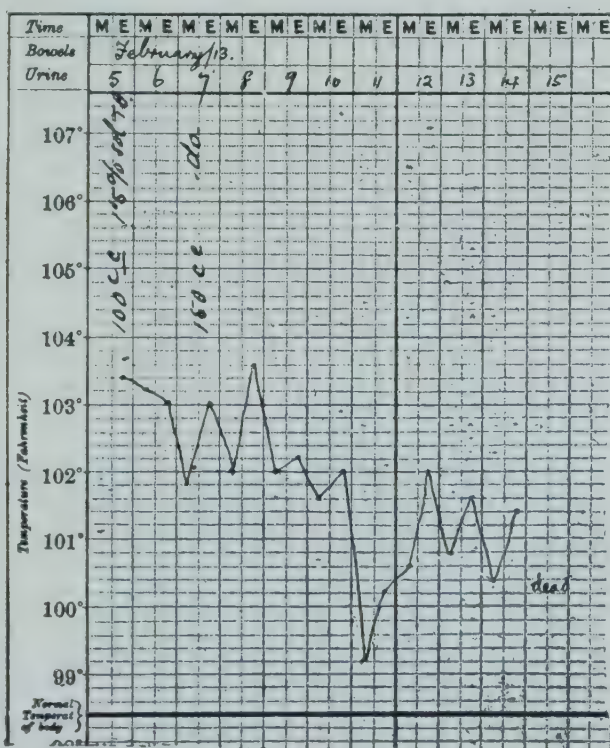
Drawings were made of the various forms of parasite met with, and from the presence of the typical "cross forms" and the absence of large pear-shaped forms, it is believed that the infection was due to the so-called *Nuttallia equi*, except that the number of red-blood-cells involved was greater than in cases reported by Nuttall & Strickland, in whose cases the infected corpuscles did not exceed 13.2 per cent.

It would appear from the foregoing observations that trypan blue has little or no specific effect upon the parasite of the local biliary fever, for we know that when this agent is applied in cases of piroplasmosis of the ox and dog it is followed by an almost immediate and complete disappearance of the parasite from the red-blood-cells, and as a rule brings about a fall of temperature on the following day.

From the present case, and from others observed in the field, one is inclined to the opinion that not only does this drug exert no beneficial effect, but that it may even prove harmful to the subject. The experience of others in this connection would be of interest.



*Nuttallia equi* (Laveran). Diagram shewing the forms of parasite seen in the red-blood-cells of a horse suffering from biliary fever.







## Some Notes on Live Stock in Germany.

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By DR. F. GURADSE, Agricultural Attaché to the Imperial  
German Consulate-General, Cape Town.

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### FRIESLAND CATTLE.

Germany is a country where cattle breeding is widely in vogue, as is proved by the fact that in 1913 the number of cattle in the country amounted to about 20½ million head. As the greater part of Friesland, namely East Friesland, is a part of the Prussian Province of Hanover, the breeding of Friesland cattle has spread from this district, as well as from Holland, practically over the whole of Germany. In nearly every Province a Friesland stud-book society has been established, and the registered Friesland pedigree cattle number about half a million.

The German stud-book societies are not only content with registering the pedigree cattle in the stud-book, but also exercise a permanent control, with a view to ensuring the breeding being carried out on the proper lines in the herds under their authority. Every herd is inspected twice yearly by a competent committee of Friesland experts, and all animals which are not up to the standard are struck off the stud-book.

Nearly all stud-book societies are working hand in hand with societies controlling the yield of milk. The officials of the last-mentioned societies measure and weigh the milk obtained from each cow in the course of one day once every fortnight, when the milk of each individual cow is also tested with regard to the butter fat content. The knowledge so obtained enables the breeder to part with cows which do not produce satisfactory quantities of milk or butter fat.

The cattle are reared in the open on the pastures, and are therefore exposed to a severe climate, thereby acquiring a strong and hardy constitution. Once or twice a year every cow is also subjected to a veterinary inspection respecting tuberculosis. The animals are tested by the tuberculin test, as well as by the so-called clinical or Ostertag test. In case tuberculosis has been found to exist, the infected animal has to be destroyed immediately. Should an animal be suspected to suffer from tuberculosis, it is then isolated and subjected to a final test after a certain period has elapsed.

### MERINO SHEEP.

The number of wool sheep in Germany has decreased considerably since the wool prices dropped, owing to the increase of the wool production of Australia and South Africa, and also in consequence of improved machinery for manufacturing purposes. It did not pay the farmers any longer to keep sheep on the valuable lands in Germany, and so the number of sheep diminished from about 25 millions in 1873 to about 6 millions in 1913.

Despite this large decrease in number, the quality of the sheep bred by the German stud flocks under control of the Agricultural Society of Germany is still of the highest standard. The Saxon Merinos (Electoral), Rambouillets, Negrettis, heavy-bodied Merinos bred for wool and carcase, and certain other types of Merinos, are equal to the best sheep of the same class reared in Australia and other countries. This is proved by the fact that constantly numbers of high-class pedigree rams and ewes are imported from Germany by some of the best stud breeders of Australia, South Africa, America, etc.



## Buckwheat.

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By H. GODFREY MUNDY, F.L.S., Government Agriculturist  
and Botanist.

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The present season, with its light and variable rainfall, has seriously hindered the seeding of our staple crops at the usual dates, and many farmers have felt the need of a quick-growing catch-crop. The result has been an increased demand for buckwheat, a crop which in normal seasons usually receives but little attention. The object of the present article is to place before Rhodesian farmers some information regarding the cultivation of buckwheat and the European market which exists for this grain, since it appears to the writer that it might well be grown more systematically with a view to an export trade as well as for local use.

For the following statistics regarding the European trade in buckwheat, we are indebted to the Director of the Imperial Institute, South Kensington, London. The imports of buckwheat into the United Kingdom during the year 1912 amounted to 71,010 cwt., of which 48,800 cwt. came from Russia. Russia is the largest producer in Europe, followed by France and Austria. France, however, in 1911 *imported* no less than 118,000 cwt. of this grain, of which again 116,000 cwt. came from Russia. The production in these three countries during recent years is given as follows:—

|                             |                 |
|-----------------------------|-----------------|
| European Russia (1911)—in-  |                 |
| cluding Poland and Northern |                 |
| Caucasia . . . . .          | 20,869,425 cwt. |
| France (1910) . . . . .     | 11,918,406 cwt. |
| Austria (1911) . . . . .    | 2,081,786 cwt.  |

During 1913 the Russian and French buckwheat, marketed at Hull, ranged in price from 27s. 6d. to 32s. 6d. per quarter of 420 lbs., and more recently (March, 1914) the French product was quoted at 36s. per quarter. The two varieties of buckwheat most grown in Rhodesia, namely, "large seeded Japanese" and "Silver hulled," are varieties of the common buckwheat, and similar to that grown in Europe. The Russian output, however, probably includes "Tartarian buckwheat" (*Polygonum tartaricum*), which is grown in Tartary and Siberia. From the above particulars, it would appear that the continental demand for buckwheat is mainly supplied by Russia, and that in exporting to Europe Rhodesia would have to compete chiefly with the produce of that country.

The buckwheat plant is of erect habit of growth, and, under favourable conditions, the Japanese variety will attain a height of 3 feet, though late sown crops and the other varieties are usually somewhat shorter. The stem is greenish red in colour, but as maturity approaches turns brown. Only one stem is produced from each seed, but the plant branches freely, and thus adapts itself to the thickness of seeding. The flowers are white, slightly tinged with pink, and a crop of buckwheat in full flower presents a most attractive appearance. The flowers are borne in clusters at the ends of short flower stems which spring from the axils of the leaves. Owing to its branching habit of growth, new flowers are produced fairly continuously during the growing period, and it is not usually possible to attain an even-ripening without suffering loss of the earlier matured seed.

As has been indicated, there are several varieties of buckwheat in cultivation—the common type (*Polygonum esculentum*), which includes the Japanese and the silver hulled and grey hulled, is the most valuable. Tartarian buckwheat (*Polygonum tartaricum*) is a smaller seeded variety, and is perhaps better suited for poultry feed, but is a somewhat shy cropper compared with the Japanese. Notch-seeded buckwheat (*Polygonum emarginatum*), which appears to be a sub variety of *P. esculentum*, has also been tried in Rhodesia, but has little to recommend it. The Japanese is the largest seeded of the varieties, and is the one most commonly grown in Rhodesia at present. The seed is brown to brownish black in colour.

whereas the silver hulled or grey hulled is smaller in size, less angular, and, as the name implies, is of a silver greyish colour.

Variety trials with this crop have been conducted on red land at the Botanical Experiment Station, Salisbury, during the past three seasons, and in these Japanese buckwheat has easily and consistently stood first as the best yielder. Sown 12th January, 1912, and reaped 18th March (66 days), it returned  $6\frac{1}{2}$  bags (1,320 lbs.) per acre. In the subsequent years' trials the results were as follows:—

## 1912-13.

| Name.         | Previous crop. | Sown.  | Reaped.  | Yield per acre. |
|---------------|----------------|--------|----------|-----------------|
| Japanese      | Vetches        | Jan. 7 | March 27 | 2,048 lbs.      |
| Grey          | "              | " 7    | " 26     | 704 "           |
| Silver hulled | "              | " 7    | " 26     | 1,000 "         |
| Tartarian     | "              | " 7    | " 12     | 1,080 "         |
| Japanese      | Castor oil     | " 13   | April 6  | 1,296 "         |
| "             | New land       | " 13   | " 21     | 664 "           |

## 1913-14.

*Variety Trials.*

|               |         |         |          |            |
|---------------|---------|---------|----------|------------|
| Japanese      | Cowpeas | Jan. 13 | March 28 | 1,840 lbs. |
| Silver hulled | "       | " 13    | " 23     | 1,380 "    |

The outstanding features in these trials are the heavy cropping powers of Japanese buckwheat and the great reduction in yield due to late seeding on new land but recently broken up. Buckwheat has frequently been regarded as a crop for the poor or lazy farmer, and it certainly will give some return when sown late on poorly worked land. Under such conditions, however, it is hardly a profitable crop except for poultry feed, but the position is decidedly altered if yields of 8 to 10 bags per acre, worth 13s. to 16s. per bag of 200 lbs. on the European market, can be secured. In passing, it may be mentioned that the rainfall at the Botanical Experiment Station in the season of 1913 amounted to 30 inches, whereas in the corresponding period of this year (1914) it only reached a fraction over 21 inches. This fact may account for the decreased yield of Japanese as compared with the previous years' trials. The following average analysis of a number of samples of buck-



wheat is taken from Bailey's Cyclopedia of American Agriculture, and appears to indicate that buckwheat might also with advantage be grown more extensively in this country for home feeding:—

|                             | Grain. | Straw. | Hulls after<br>milling. |
|-----------------------------|--------|--------|-------------------------|
| Number of Analyses ...      | 8      | 3      | 3                       |
| Water ... ..                | 12.6   | 9.9    | 10.1                    |
| Ash ... ..                  | 2.0    | 5.5    | 2.0                     |
| Protein (N. x 6.25) ...     | 10.0   | 5.2    | 4.8                     |
| Crude fibre ... ..          | 8.7    | 43.0   | 44.7                    |
| Nitrogen free extract... .. | 64.5   | 35.1   | 37.7                    |
| Fat ... ..                  | 2.2    | 1.3    | .9                      |

Reference has been made to the suitability of buckwheat as a quick maturing catch crop, and this will be better understood when it is pointed out that the normal period required from seed time to harvest is nine to ten weeks. It is safe to say that, given equal attention, there is no other grain crop grown in this country which will afford an equally heavy acre yield, of similar monetary value, in so short a growing period, and entailing such a small amount of labour in its production.

A frequent cause of small yields with buckwheat is insufficient attention to the seed bed. The proper working of land to a state of tilth suitable to the crop which will be grown upon it, is one of the secrets of success in arable farming. Buckwheat is usually broadcasted, and to ensure a regular seeding and an even germination, a comparatively fine seed bed is very desirable. Care should, therefore, be taken to harrow and, if necessary, clod crush the land before seeding, and as a reasonably firm bed is a further desideratum, this can be obtained at the same time. Seeding should not be delayed too late in the season, otherwise the crop is liable to suffer from sun scorch, hot winds and drought generally. Where this occurs, the later maturing seeds fail to fill. From the first to the second week in January appears the best date for seeding in Mashonaland, though perhaps somewhat earlier may be recommended for Matabeleland. Thirty to forty pounds of seed per acre should be broadcasted and then harrowed in, but when drilled with an ordinary small-grain drill, a rather less amount will be

required. Quick growing as it is, buckwheat requires reasonably clean land, otherwise the young plants may be crowded out. It cannot be regarded as both a grain crop and a cleaning crop, nor can it with economy be hand weeded. In the rotation, therefore, and where a heavy yield of grain is required, it should follow at least some partial cleaning crop such as maize, roots or beans.

Provided clean land has been chosen, no cultivation is required, and the next process is harvesting. As has been said, the crop does not ripen quite evenly and some experience is required in selecting the time of reaping. Ripeness is indicated by a general browning of the crop, but some flowers will still be noticeable on the lower branches. If left too long, the earlier matured grains may be shed, and, if cut too soon, a proportion of the seed will be still unripe. Cutting should always be done in the morning while the plants are damp with dew, as this, to a great extent, obviates shattering the seed. Mechanical reapers are again apt to shake out the seed, and the crop is, therefore, best cut with the sickle. As it is cut, it should be tied in sheaves, and the sheaves set up in shocks or stooks. It is well to allow these to stand in the field for two or three weeks before threshing, as by so doing, and provided the rains have ceased, the colour and quality of the grain will be improved.

Any undue handling will entail loss, and buckwheat is not, therefore, usually carted to the homestead, but is threshed in the field. At present the grain is generally beaten out with sticks on a hard threshing floor, and afterwards winnowed, but any threshing machine suitable for small grains should deal with the crop satisfactorily, especially if the spiked concave is removed and a plain one substituted. Owing to the brittleness of the straw and the looseness of the grain, buckwheat is one of the most easily threshed of all farm crops.

Ground buckwheat, owing to its high protein content, can well be utilised in moderation for stock feed, especially for dairy cows, while, when fed to fowls, the grain is reputed to have the effect of stimulating egg production, though whether this is so or not appears uncertain. If cut in a semi-ripe stage, the fodder (stalks and seed heads) makes good feed for stabled

horses or for pigs, and the plants when in flower are well recognised by bee-keepers as a most valuable source of honey. Still another use to which buckwheat is frequently put is that of a green manure crop, especially for orchards. Though not a nitrogen gatherer, it produces a considerable bulk of green stuff per acre, and this, coupled with its rapid growth, renders it particularly suitable for green manuring.

In conclusion, in buckwheat we have a crop which can be put to a variety of uses, which, if exported, will command a price fully equal to, if not greater than, maize, and which can probably be produced as cheaply as any other crop one may name.





Japanese Buckwheat, 1914. Yield, 1,840 lbs. per acre.



Silver hulled Buckwheat, 1914. Yield, 1,380 lbs. per acre.





## Fertilisers, Farm Foods, Seeds and Pest Remedies Ordinance.

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It will be gratifying to farmers to learn that a law for their protection in purchasing artificial manures and certain other commodities in frequent use has been passed during the recent session of the Legislative Council, and that its promulgation at an early date may be anticipated.

The following is the debate which took place in the Council on the 7th May:—

The Director of Agriculture moved the second reading of the Fertilisers, Farm Foods, Seeds and Pest Remedies Ordinance. He said he would try to avoid the technicalities inseparable from legislation of this description. The prime intention of the proposal was protection—protection to the farmer and protection to the merchant. The proposal offered further great encouragement to the use of fertilisers in particular, and by so doing it opened up room for fresh enterprise in the country, which experiment and experience had alike proved to be very profitable to them. It was further calculated to increase confidence in the sale and in the purchase of fertilisers, and in every way to encourage the honest trader and benefit the commercial community. In this region of trade, fraud was unfortunately singularly easy, and without some such legislation very difficult to bring to book. Corresponding laws of this nature were passed practically in all civilised countries where agriculture was in an advanced state. Particularly was that the case in the United States of America, where legislation on these lines had been in force for many years, and it also held good in the Cape Colony, where for the past seven years an Act similar to this Ordinance had been in force. As giving an impression of the views held on this Ordinance he would quote very briefly two authoritative statements on the point. The first was from the Acting Under Secretary for the Cape Colony in a report in 1911, in which he referred to the question



at length. He said:—"This Act has done much to put the sale of fertilisers on a sound basis in the Cape." That was sufficient justification he (the speaker) contended for such an Ordinance. Then, quite lately, he had the opportunity of discussing the administration of the law in the Cape with the official who had been in charge of it since its inception, Dr. Juritz. He had informed the speaker that it had been found to be satisfactory. Then in his report the Secretary for Agriculture of the Union of South Africa—premising by stating that the Ordinance had only been in force in the Cape Colony and not in the other provinces—said:—"It is desirable that legislation should be introduced at an early date dealing with the sale, standard of purity, adulteration of artificial manures, seeds, material for dipping, spraying trees, etc." In the report for the current year he urged that such legislation should be applied to the entire Union of South Africa.

He (the speaker) would like to explain to the Council the objects and the occasion for the present measure before the House. He had before him some figures which were interesting and very instructive. In the course of the last eight years the introduction of fertilisers into Southern Rhodesia had increased by leaps and bounds. There was an increase from £114 worth in 1906 to £15,222 in 1913, which was an increase of 113 fold in eight years. In each of the last four years the importation of fertilisers had doubled. Four years ago it was £1,764 as against £15,000 odd now. In the Union of South Africa the increase in the sale of fertilisers had been very remarkable. It had increased from £34,844 worth in 1907 to £124,000 last year, an increase of four-fold in six years. Those were remarkable figures, which must impress them. It was not contended that the increase was due to the Ordinance, but it merely justified the imposition of such laws as were proposed now. Although last year they imported over 1,500 tons of manure into Rhodesia, the trade was still in its infancy, and the application of the Ordinance could not be regarded as imposing any burden upon the commercial community or any new hardship. The trade was only beginning. It would grow up under the law, and would be encouraged and assisted thereby. Their total figures were very small, he admitted, but judging by the increase in the past, they would soon be very considerable. He went on to say that fertilisers were first

used for tobacco, and then extended to potatoes, and recently experiments had been conducted by the Department of Agriculture and farmers, and had demonstrated that on the great majority of their soils the application of fertilisers to maize was very profitable indeed. Maize being their chief crop, the experiments had opened up great possibilities of increasing the total production of the country. From a small beginning it had become an important question to them, and they could reasonably foresee that the trade in fertilisers would be a large one. It was unavoidable in the present circumstances of Rhodesia that farmers were very ignorant of the properties of fertilisers and the manurial constituents and the value of them, and although they displayed a very keen interest in fertilisers, still they were liable to be readily misled. Therefore they required protection and guidance. It was manifestly a very fitting sphere of government activity to protect those individuals who were not in a position to protect themselves. Unfortunately it was impossible to judge of the merits of the fertilisers by the mere appearance of the powder. There was no ready means of judging and of ascertaining the composition of fertilisers except by the process of analysis. That was the basis of the whole question. In describing the composition of fertilisers there was very great room, he would not say for fraud, but for misleading words, which, although accurate in terms, were calculated to mislead the uninitiated. By those means it might appear that a fertiliser which was apparently less costly per ton than another, was really of much more value, and contrarywise a fertiliser which appeared to be the richer of the two was actually the poorer. He wished to avoid entering into details of chemistry. He said the value of a fertiliser depended upon its composition, and therefore it could only be properly valued by stating in simple terms what that composition was, and throughout having some system of nomenclature. It was very desirable to secure uniformity in the description of those things. The difficulty of the position was fully realised by the farming community of Rhodesia, and it had been brought to the notice of the Government by resolutions at the Farmers' Congress, both last year and this year, and the aim of the Ordinance was to achieve the end which the farmers had in view.

That, however, was not the only direction in which they were meeting the demands of the farmers. He would like to



take the opportunity of pointing out that the Farmers' Congress had been urging repeatedly that the railway rates on fertilisers should be reduced, as the freight constituted one of the heaviest portions of the value of a manure. Representations had frequently been made with the following rather noteworthy results:—Since November, 1911—within the last 30 months—reductions on railway rates on fertilisers had taken place on five separate occasions, the last one being on the 1st of the current month, and the railage on fertilisers had been reduced throughout the whole system, and in certain cases he would mention from 64s. 10d. down to 40s., from 90s. 10d. down to 46s. 10d., and from 140s. 10d. to 57s. 9d. These were very notable reductions, and they must lead to an increase in the purchasing of fertilisers in this country, and that was, therefore, justification for mentioning them on the present occasion. Those rates held good to the extreme end of their districts where arable farming was most in progress. They could carry fertilisers from Beira to Eldorado and Mazoe from 40s. per ton, and to Umvuma at 51s. 7d., while if they took the extreme limit of the line, they could carry to West Nicholson for 57s. 9d.

The price of fertilisers was a great burden in the country, but it was not so heavy as at first sight appears, because of the simple fact that, whereas in Europe the quantity applied to the land was five, six or seven hundredweight—which amounted to 600 to 800 lbs.—their experience in this country was that sufficient benefit could be got out of 100 to 150 lbs. per acre. So that the high costs were not so great a disadvantage.

The methods proposed in the Ordinance shewed that the machinery would be extremely simple. There were only four steps which he need refer to. The first was that each special class of fertiliser should be registered each year; the second was that the composition should be guaranteed by the manufacturer or his agent; the third was that it should be distinctively marked; and the fourth was that of Government control, whereby the Government might from time to time make tests to ascertain whether the fertilisers agreed with the guarantees given by the makers. That was not a difficulty to the maker, for he would be at liberty to make what guarantee he chose so long as he conformed to it. Anyone conversant



with the manufacture of artificial fertilisers knew that it was easy to produce an article of a certain composition to within a few decimal points. The offences under the law were few and simple. The sale of any fertiliser not registered was an offence. The failure to register any fertiliser already on the market was also an offence. False description was wrong, and the misuse of certificates of brand was rendered culpable. Beyond those there was no burden on anyone. The Government was empowered to frame and enforce regulations to that end, but the limits were strictly laid down, so that it could not be said that they were asking for powers to deal autocratically with the matter. Under section 5 the limits were carefully indicated, so he would only refer to two examples. The one was to provide that the composition guarantee should be stated in simple and explicit language, and the other was that of the case of a purchaser who wished to have his fertiliser examined because he doubted the composition. In the latter case samples had to be drawn in the presence of witnesses, and three packets had to be made up—one to be retained, one to be sent to the manufacturer and one to go to the analyst.

He had continually referred to fertilisers, but the Ordinance went further and applied similar restrictions and regulations to the sale of farm foods. As yet that was a small matter, but it was growing, and it was as well when legislating in that direction to deal with it. Farm cake was manufactured on a large scale, and molasses were also largely used, while a local oil factory had been spoken of, and one of the main products would be oil cake to be fed to stock, and therefore it was necessary to have the machinery for preventing the adulteration or faking of those commodities. Pest remedies used in the fruit industry were secured in regard to purity under the Ordinance. Seeds being a "live" article, no such standard could be imposed on them, so it was provided that they could be tested, and a certificate given to the dealer describing the quality at the time of examination, and indicating whether they were of normal vitality and purity, or whether they contained deleterious ingredients such as weeds, etc. That portion of the Ordinance would be more in the way of a wholesome preventative of crime. He commended the Ordinance to the House, and moved that it be read a second time.

Mr. Edmonds said he had to congratulate the Director of Agriculture and the House on the Ordinance. He believed that the Director had been very largely instrumental in framing that very Ordinance some years back in the south, and that in its operation there it had not been found necessary to amend it. That shewed that it had been carefully thought out. Excellent as it was, however, he had been disappointed to hear from the Director that it was not possible to protect seeds. He had found, in regard to seed mealies particularly, that one never got what one bargained for, and he hoped it would be possible to make some regulation to deal with that. With regard to the examination of farm seeds there was always the danger of the importation of some noxious plants. He knew that in one's lands one sometimes found the most weird things coming up with imported seed, and it was quite possible to introduce some weed which might give great trouble to exterminate. It appeared to be an extremely difficult thing to deal with those matters; if it were not, he hoped that something would be done in that direction.

Mr. Cripps said he had pleasure in giving his cordial support to the Ordinance. Farmers had repeatedly demanded such an Ordinance, and would be pleased to hear of the intention of the action of the Government. The farmer had been amply protected by various laws in the prosecution of his work, and that further law was tending towards that perfection all desired to see arrived at. The farmer was helpless in many ways, and it was necessary that he should be protected by the Government. No other section of the community had had the same amount of protection and attention as the farming section, and he (the speaker) agreed with the remarks made by the member for Bulawayo in an election speech, when he said that the time had arrived when the farmers should be able to shew some more substantial results for the feeding they had received at the hands of the Administration. He thought that the Ordinance before the House would help the farmer to justify himself in the eyes of the country. There was no doubt that fertilisers would be required to an ever increasing degree, and the farmer could in future be assured of securing a perfectly reliable article. With regard to a remark made by the member for the Northern Division, he (the speaker) thought that there was a certain amount of protection in connection



with the importation of seeds, and he thought it a very necessary one. They had seen that in the case of seeds imported into the Union—especially *paspalum* grass—that there was a very small percentage that germinated, and if seeds of that grass sent to the country were tested they would find that they seldom got good results. Those seeds must have been kept for a season too long, and year after year they had been supplied with such seeds.

Colonel Napier said he congratulated the Director of Agriculture on the Ordinance which he was pleased to give his support to without repeating the statements which had been made by his colleagues.

The Director of Agriculture said he had to thank members for the kindly reception which had been given to the measure. He desired to explain one thing which he did not appear to have conveyed sufficiently clearly to the House, and that was the question of seeds. Hon. members would notice that section 5, sub-section 4, provided that regulations might be made for the furnishing by the seller to the purchaser of guarantees with regard to purity and germination. That was as far as they could go, and possibly his apologetic tone had not conveyed that that went a very long way. Their difficulty was that they could not, as with fertilisers and other artificial things, fix a standard in the case of seeds. But they could require those guarantees, and he would allude to the existing regulation in the Cape which provided that any purchaser was entitled to have seed examined by a competent seed tester, and the certificate issued stated exactly the quality of the sample, the amount of inert matter, the amount of foreign seeds, the amount of true seed and the time it took to germinate.

The Ordinance passed through the Committee stage without amendment, and was read a third time on Friday, 15th May.



## Cream.

### ITS SEPARATION, HANDLING AND SALE TO BUTTER FACTORIES.

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By R. C. SIMMONS.

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The production and sale of cream to a butter factory is a comparatively new industry to most farmers in Rhodesia. In every other farming country in the world where butter factories have been introduced, it has been found that a satisfactory understanding between the suppliers as a whole and the factory and the perfectly smooth working of the industry has only been arrived at after the lapse of a few years, during which time the suppliers have thoroughly grasped the principles of the new business.

With this knowledge before us we can hardly expect to be so fortunate as to develop our creamery business without passing through a somewhat similar experience. To be forewarned is to be forearmed, and it is hoped, therefore, that the following notes may be of service to those farmers who are selling cream, and may prevent much of that annoyance and irritation which so often arises from a lack of knowledge.

**THE PRINCIPLE OF MECHANICAL CREAM SEPARATION.**—The butter fat of milk exists in the milk in the form of minute globules, which are held in suspension. The specific gravity of fat is less than that of water, casein and other constituents of milk. In plain language, fat is lighter than the other substances mentioned. If one takes a small piece of iron and a piece of wood of equal size, and ties to each a string of equal length, and then, holding the free end of the strings in one's hand, whirls them round and round, it will be found that the iron will straighten out its string to full tension before the wood will. Why? Because the iron is heavier. By whirling

the strings round, one is exerting what is called centrifugal force, that is, a force driving from a centre—in the case of the wood and iron the centre is represented by one's hand.

When we place milk in a bowl and spin the bowl round at a great pace, this same force is exerted on the particles of milk. The water, casein, sugar and so on, being heaviest, get to the outside of the bowl first. It is obvious, therefore, that the fat must remain towards the centre, the best and richest globules, being lightest, right on the centre, and the inferior ones slightly removed from the centre according to quality.

This is really all that is done by the separator. The various arrangements of tin discs, tubes, pipes and so on, are merely arrangements for facilitating the work and drawing off the cream and skim milk separately. Simple as this seems, there are, however, certain conditions under which it can take place easily and approximately perfectly, and *vice versa* conditions which are detrimental. A very great force is required to act on the small particles of the milk sufficiently quickly to allow the fluid to run continuously and also to overcome the friction of the heavier particles against the lighter ones in their journey to the outside of the bowl. The quicker the bowl revolves the greater the force. The bowls of most separators make from 3,000 to 5,000 revolutions per minute, hence the necessity for machines of the best material and mechanical construction.

RULES TO BE OBSERVED IN THE WORKING OF SEPARATORS.  
—The question of overcoming friction is really, as it were, at the bottom of all the rules and regulations which the separator operator is called upon to observe. A good, reliable make of separator should be chosen—one which is mechanically well constructed and is easily cleaned. The writer advocates those makes of separator of which practically the whole surface of every part can be readily seen. Very cheap makes usually work very well at first, but are liable to go wrong quickly owing to faulty material or construction. It may be noted here, too, that the oldest and best manufacturers of separators have found it impossible to obtain the best results with machines which have not the "tin discs" or some equivalent arrangement in the bowl.

Having chosen a good machine, see that it is very firmly fixed and set perfectly level on its base and that all the parts are oiled. Care should be taken that the oil runs properly from the cups on to the bearings. The handle of the machine must be turned in a regular, even way. Jerking it, by putting more pressure on the downward stroke than on the upper, as one might, perhaps, in turning a chaff-cutter or a root-pulper causes uneven running. The foregoing precautions are all to preserve the machine in good order, and thus reduce vibration, which tends to increase the friction above referred to. The speed of the machine must be worked up gradually in order to avoid strain on the working parts, and the milk must not be allowed to run in until the full speed is attained. The writer has noticed that farmers are often indifferent to the directions given on most separators as to the speed at which the handle should be turned. If the directions say 40 revolutions per minute, this is the pace at which the machine should be worked. If the proper pace of the bowl is 4,000 revolutions and that of the handle 40 revolutions per minute, one turn of the handle makes a difference of 100 revolutions in the bowl—a very considerable item. If the milk is allowed to run in before the right speed is attained, it will run out again before sufficient force has been brought to bear on it, and imperfect separation will result.

The temperature of milk greatly affects the friction of the particles one against the other. It is common knowledge that nearly all substances except water contract when cooled and expand under the action of heat. Water also is governed by this law until it approaches very near to freezing point. Now, if milk is put through a separator when it is cold, it is denser and the friction of the particles is increased. If it is put through at a temperature of 90 degrees F. in summer to 120 degrees F. in winter, separation will be more complete than if lower temperatures are used. As a general rule the temperature at which the milk comes from the cow, namely 100 degrees F., or as near that as possible, will be found to be suitable. This is a very important point, and if the milk has for any reason become appreciably reduced in temperature below the figures given, it should first be warmed by standing the bucket in a vessel of warm water and stirring until the



desired temperature is attained. Should the separator be very cold, as it may be on winter mornings, it is advisable to run a little hot water through before separating. It may be mentioned here that milk which is even slightly sour does not separate so well as fresh milk.

PERCENTAGE OF BUTTER FAT IN CREAM.—Now we come to the point which is the cause of so much trouble, namely, the thickness or quality of the cream. When separating milk, the object is to remove as nearly as possible all the butter fat from it. In practice this can be done by means of an ordinary good machine properly manipulated, so as to leave not more than 5 per cent. of fat in the skimmed milk. The thickness or quality of the cream must not be confused with the quantity of fat taken out of the milk. It is quite possible to skim the same sample of milk and produce at one time thick cream and at another thin and still leave approximately the same quantity of fat in the skim milk. When cream is thick, the fat has been taken away with a very small proportion of skim with it. When the cream is thin a larger proportion of skim is taken away with it. It will be noticed in all separators that the outlet for the cream is quite close to the centre of the bowl, and that the outlet for the skim is further from the centre. It has been pointed out that the action of centrifugal force has the effect of driving the skim to the outside of the bowl, thus leaving a column of cream in the centre. As more milk is allowed to enter the bowl, so a corresponding quantity must escape. That part nearest the centre of the bowl (cream) escapes by the outlet nearest the centre; that part lying immediately behind it escapes by the outlet further back. The outlet for the skim might be on the edge of the bowl, but is placed near the centre to reduce friction and froth.

The regulation of the quality of cream may be brought about by the following methods:—(1) If the cream regulator screw is screwed slightly inwards towards the centre of the bowl, it moves the outlet for the cream nearer to the centre and further into the column of cream in the centre of the bowl. Thus either only the best and richest globules of fat lying nearest the centre escape by it, or the smaller globules do not reach it until they have almost completely separated from the skim milk lying behind them. If the machine is turned at the

right pace and the inflow of milk is properly regulated, the latter action takes place with no resulting loss of fat, but in either case the cream is thicker. If, on the other hand, the cream regulator screw is turned outwards, away from the centre, so as to withdraw the cream outlet back towards the line of the skim milk, the right proportion of fat may be separated, but a certain amount of skim is taken with it into the cream receptacle and the cream is found to be thinner. It should be noted in adjusting the cream regulator screw that a very slight movement of the screw is sufficient to make a considerable alteration in the cream.

(2) If the flow of milk into the bowl is retarded, the outflow is also retarded. Therefore, milk remains a longer time in the bowl under the influence of centrifugal force. The result is that the fat globules are more completely collected at the centre, less skim is mixed with them, and the cream is thicker. Quickening the flow of milk whilst running the machine at the same pace has the opposite effect.

(3) If the flow of milk remains the same, but the pace at which the bowl revolves is increased, a greater amount of centrifugal force is brought to bear on it, which has the same effect as exerting the lesser force for a longer time, as in method No. 2, and the result is thicker cream. Slackening the pace of the bowl while the inflow of milk remains the same has the opposite effect, namely the production of thin cream. If carried to excess very imperfect separation takes place.

It will easily be seen how all these various methods may be intensified by using them in conjunction with one another. It is advisable, however, to try and arrive by experiment at the right position for the cream regulator screw and the correct rate of inflow for the milk, and then to work the machine always at the pace advised by the makers.

It is especially desirable to avoid altering the pace of the bowl or the rate of inflow during separation, as it produces irregular cream, which is detrimental to its keeping qualities. It may, perhaps, be mentioned here that as no milk or cream can flow out of the bowl unless milk flows in, the last bowlful of whole milk must be driven out by pouring in about enough skim milk to fill the bowl after the whole milk has gone



through. In doing this, what is apparently cream will appear to come off for a long time, but it is in reality largely impurities, and the machine should not be run longer than will suffice in the judgment of the operator to empty the bowl once.

The reader will naturally enquire, what is the right consistency of cream? For butter-making purposes at home it is as well to skim the milk so that the cream shews about 35 per cent. of butter fat. This means that there is a rather larger proportion of skim in the cream, but if it is to be churned at home it is no great disadvantage, and there is less risk of fat being left in the skim in the effort to avoid skim coming away with the cream. For the purpose of sending cream to a butter factory it would at first sight seem wise to separate the cream having 50 per cent. or 55 per cent. of fat in order to avoid paying transport unnecessarily on skim milk. There are reasons, however, why it is not wise to do so. First of all, in the effort to produce very rich cream, the smaller globules of fat are liable to be left in the skim milk; secondly, very thick cream is not suitable for butter-making without being first thinned down, and as a matter of fact factories find that they can best handle cream shewing from 38 per cent. to 45 per cent. of fat, and prefer it on the lower rather than on the higher side. It is not wise to produce the cream with a less percentage of fat than this, because room is taken up in the can by skim milk, and also, a fact which is really much more important, cream containing an excess of "skim" is much more liable to turn sour quickly and to develop bad flavours than cream which contains a small proportion only. From 38 per cent. to 45 per cent. then may be said to represent the happy medium.

The writer has heard complaints from farmers to the effect that while they had the same class of cows as their neighbour, pasture as good, and were themselves just as good managers, the factory only credited them with, say, 35 per cent. of fat in their cream and allowed the neighbour 45 per cent. From the foregoing it will be seen how easily this may occur without a fault on the part of the factory, and even without any real difference in the money earned by the two herds of cows. Another question the reader will ask is, "How is one to know when one's separator is running properly?" This can really



only be ascertained by a chemical analysis of the cream and of the skim milk. The factory tests the cream. The skim milk must be tested at home, and arrangements are being made for those members of the Agricultural Department whose duties are connected with such matters to carry the necessary apparatus with them on their tours so that they may be able to make tests for farmers if desired. In the meantime attention to the foregoing rules in connection with the working of the separator will go a long way towards preventing serious loss. Of course, cream may appear thick when it is cold and thin when it is warm. This must not be confused with its consistency due to the proportion of butter fat it contains.

THE HANDLING OF CREAM.—There remains the question of the quality of cream as applied to its flavour and freedom from undesirable substances. Often as the advice has been given, one can only repeat that the question is entirely one of cleanliness, real cleanliness, not merely neatness. Milking should be done in a clean place free from dust. If shedding for all the cows in the herd is not available, it is sometimes possible to construct three or four stalls into which the cows may be driven to be milked as desired, and which may be kept scrupulously clean at a small cost. It is not expected that in practice the cows' skins will be kept entirely free from dust, but they should be lightly brushed over once a day, and any dung adhering to the quarters, etc., should be removed. In any case the udders should always be wiped with a clean, damp cloth in order to remove the dust from them before milking. All milkers should wash their hands before milking, and facilities for this should be provided near the milking shed. In addition, the writer strongly advocates the wearing of white smocks by all milkers. Such smocks can be easily kept clean (in the case of boys they would soon learn to wash their own), and their use would obviate much of the filth and dirt which must often find its way into the milk from the bodies and clothes of natives. All milking utensils and all separator parts should be cleaned immediately after use by being rinsed first in cold water and then in hot, and then placed in a rack open to wind and sun, but as free as possible from dust, until required again. The milk should be removed as quickly as possible from the precincts of the cowhouse, and should be immediately strained through a type of strainer having cotton

wool discs as well as gauze, and straightway put through the separator. After separation, if the cream is to be sent away at once, it must be passed over a cooler and cooled down to as low a temperature as possible. If not to be sent away immediately, it should be placed in a drum or similar open vessel, covered with light muslin to keep out the flies and dust, and placed in a cool airy place removed from the neighbourhood of the kraals, pigsties or other places where manure and refuse is liable to accumulate.

It is usual for the cream from three or four separations to be sent to the factory in one lot. When this is the case the warm cream should not be added to the cooler cream of the previous separation, but should be run into a separate vessel and treated just like the first lot. When it is thoroughly cool it may be added to the first lot and the whole thoroughly stirred. In any case, cream should be stirred up twice a day and whenever fresh cream is added to it, and should never be kept in an enclosed or narrow-necked vessel, such as a bucket with a lid or the type of cans used to send it away in. The greatest care should be taken to see that the cream cans in which it is sent to the factory are really clean and sweet. Arrangements should be made to avoid the cans being exposed to the sun; a good plan is to cover them while in transit with a wet sack or cloth. Transportation should, as far as possible, be done in the cool hours of the day or night. The length of time that cream may be kept before being sent to the factory will vary with the time of year and the weather. So long as no bad and undesirable flavours develop, a slight sourness is not detrimental. It must, however, be left to the discretion of the individual as to how often it will be necessary to rail it away.

## Bee-Keeping.

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By FREDERICK SWORDER, Hallingbury, Hartley.

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In the summer months, especially during showery weather when nectar is being brought home rapidly, the daily increase of bees in a well stocked hive, although thoroughly understood by experienced bee-keepers, is to the novice difficult to realise. Take, for instance, a prosperous colony at work under the above favourable conditions, and conceive if one can that a prolific queen will lay 3,000 eggs per day. In the course of a week, say from the date when the hive was last examined, there has been an increase in population of over 20,000 bees in some form of development. At this rate of progress it will readily be seen that this particular hive will soon be over-crowded, and if steps are not taken beforehand by the bee-keeper to relieve this congestion, the bees must swarm.

One way of warding off this tendency to swarm is to place above the brood chamber another storey, either in the shape of a crate of sections or a rack of shallow frames fitted with full sheets of foundation comb. This new addition to the hive will, in most instances, have the desired effect, and instead of running the risk of losing the swarm during his absence, ending in disappointment, quite a different and encouraging proposition is in store for the man who waits. Honey is what he wants, and, provided the flow of nectar continues for a month, his expectations in most instances will be realised.

This method of giving additional space in the hive is termed "supering," and is one means of relieving the congestion. Honey being the result, it is here that the frame hive comes to our aid.

Where it is desired to relieve this over-crowding, and at the same time to increase the number of stocks in the apiary.



another method is frequently adopted, for in such a case the novice must not really expect a harvest of honey, as he cannot have both, but simply an additional hive of bees.

This plan is easily accomplished if due care is given to simple details, and, provided the above favourable conditions are present, it very rarely fails. This method is termed artificial swarming, and instead of the bee-keeper waiting for the swarm to depart, he, by observing the conditions at the hive entrance, should be able to form an opinion as to what is taking place inside. In carrying out this method, certain points must be borne in mind. The stock of bees to be operated upon must be strong in numbers. There must be drones or males hatching, or on the wing, to fertilise the young queen. The day must be fine, so that there may be sufficient bees to form the swarm. The brood must be protected from cold. The swarm must be fed for a few days, but if two frames containing a fair quantity of honey are given when the artificial swarm is made, it will not be necessary to feed with syrup.

In making an artificial swarm, proceed as follows:—Secure a correctly prepared frame hive of the same internal dimensions as those already in use in the apiary, so that the frames are duplicates. It must be understood that these frames are fitted with full sheets of brood foundation and wired, but for the present the greater number of them will not be required for immediate use. Place this so-called new hive alongside the hive to be operated upon. Now, with the smoker subdue the bees, and so soon as it is considered that they have sufficiently gorged themselves with honey, remove the quilts or clothing which cover them, then lift out separately three frames of comb from the centre, and search each individual comb for the queen. When she has been found on one of these frames, place it, in conjunction with two more, along with her, the developing and adhering bees, into the new hive. The remaining frames in the old hive must be moved towards the centre; then close up the division boards, adding additional frames as occasion requires. Well cover all the frames of both hives to promote warmth. Now move the old hive, which is queenless, to a new position a few feet away, and place the new hive on the old spot, and the operation is finished.

In thinking out what has actually taken place, it will be seen that the old hive from which the queen has been removed, may be now termed to be queenless, yet in it there are present thousands of fertilised eggs, besides developing bees; thus, this hive is in the best possible condition for raising queens. These bees in the old hive, finding that their queen is gone, will, in a few hours, take steps to raise another, by commencing to build queen cells around fertilised eggs in well-ventilated and suitable positions. In the course of a week these queen cells, which hang down from the side of the combs, will have advanced considerably in size and length, for during this period these queen larvæ have had much attention bestowed on them in the shape of food of the very best quality, which has been supplied in such quantity that they actually appear to float in it.

In comparison with worker bees, which mature to sterile females, these on the fifth day of their existence are fed with a coarser food, followed by a period of rest on the sixth day, thereby causing a restriction of their ovaries; hence they are unable to lay eggs. With queens it is a different matter, for the worker bees, which in the old hive are without a queen, unquestionably realise the importance of rearing a new mother, for the existence of the whole community depends on her presence; therefore they endeavour to rear perfect females. In order to accomplish this desired object, these queen larvæ are liberally fed by the younger worker bees for six days after the hatching of the eggs, that is, right up to the time that the cells are sealed, which is accomplished on the ninth day.

Bearing in mind that at the identical period of sealing these young queens were still only larvæ, yet so rapid is their development in the pupa stage, that it seems almost incredible to realise that in another five days they will issue from their cells as perfect females. Yet it is so, and in two or three days any selected queen will be laying and doing her best to build up and restore the old hive to its original population.

By this simple method it will be seen that only one stock of bees has been disturbed, while either hive, after the operation, cannot reasonably fail to render a good account of itself. The majority of the old bees will leave the old hive for food, but when returning with their loads will make for the old spot

whereon stands the new hive, and, in spite of the trick that man has played upon them, they will join their queen and form the artificial swarm.

In order to cope with the increase of population, about every fortnight frames of brood foundation should be added to each hive. If it is wished to make more than one artificial swarm, it can be accomplished, provided one has the time, is in possession of two or three stocks of bees, has on hand some spare hives, and the time at his disposal. On the twelfth day, *i.e.*, reckoning from the date of making the artificial swarm, it being the period when all queen cells will be sealed in any hive rearing queens, an examination of the old hive can be made, to ascertain if more than one queen cell has been built and is sealed over. If several are found, we can immediately remove from any suitably strong stock in the apiary, three or four frames of brood and honey, with their adhering bees, *but not the queen*, and place these in a spare hive, setting it on a fresh spot, covering up these now queenless workers with warm clothing, and preventing the escape of any bees from this hive entrance.

The following day, these confined bees, finding they have no queen, will readily accept a sealed queen cell. At once open up the old hive again; then, having made a selection, carefully cut out with a sharp knife one of the largest queen cells seen in any convenient position. Fasten it with a pin on to a central comb in this spare hive without injury, then well cover up warmly and close in the division boards on both sides of the cluster, always bearing in mind that in the old hive one queen cell must be left.

In four days the queen will be hatched, when the entrance may be opened so that she may take her marital flight.

The above additional method is termed the formation of a nucleus, and as many nuclei may be formed according to the number of sealed queen cells found in the old original hive.

*(To be continued.)*



## Review.

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*Maize: Its History, Cultivation, Handling and Uses.* By J. Burt Davy, F.L.S. (Longmans, Green & Co., 39, Paternoster Row, London.)

The appearance of this work, compiled by Mr. J. Burt Davy, for some years Agrostologist and Botanist of the Transvaal, and later of the Union, is deserving of a sincere welcome from all South African agriculturists. The book covers an exceedingly wide field, embracing all aspects of the crop from its origin through the various phases of cultivation, seed selection, maize judging, breeds and varieties, diseases and pests, the world's commerce in maize grain, milling, chemical composition and the use of maize products in the arts and manufactures. Chapters are also devoted to the use and preservation of maize fodder in its various forms, and to the construction of maize silos.

Mr. Burt Davy's work will meet a much-felt want in South Africa, more particularly as a text book for use in our colleges and schools of agriculture. The writer is happiest in his chapters devoted to the more academic side of the question, particularly in those dealing with the botanical characters of the plant, inheritance and improvement by breeding, judging and selection for exhibition and varieties and breeds. In these is brought together a vast fund of information most valuable to intending growers of maize on scientific principles.

It is impossible to study the book without being convinced of the pre-eminent importance of the maize plant to the agricultural world at large, and especially the influence it will exert on the future of this sub-continent. The writer points out that, whereas the world's production of maize reaches the enormous figure of 1,085,700,000 bags of 200 lbs. weight, the whole of civilised Africa at present only contributes about 1 per cent. of this total. More than 75 per cent. is produced in the United States, and local markets are rapidly absorbing

the American surplus which used to be available for export. We are told that European corn brokers have recently referred to South Africa as the future maize granary of Europe, and the writer points out that if only those farms at present occupied in the Transvaal grew 250 acres of maize per 1,000 acres of land available, and returned an average yield of five bags per acre, the production of that Province alone should approximate 35,000,000 bags per annum.

References to maize-growing in Rhodesia are not very numerous, nor is the information given on this point quite up to date, as, for instance, when the writer says he is informed that "in Rhodesia the 'chocolate' soils prove best suited to maize," and, again, "the granite soils, though producing good tobacco, are found unsuited to maize growing." As a matter of fact, the average yield per acre on many Rhodesian sand veld farms is fully equal, if not superior, to the average acre-yields reported from the various Provinces of the Union, but the Rhodesian farmer who specialises in maize-growing is not satisfied with anything less than an average of 7 bags per acre in a normal season, and soils which do not give these returns are not usually regarded as good maize land. There are many farms on the maize belt where, without fertilisers, the crop over 300 to 400 acres annually averages 8 to 10 bags per acre. However, it is not to be expected that Mr. Burt Davy should be as conversant with Rhodesian conditions as with those obtaining in the Union. One would have liked to find more definite information regarding the use of machinery in harvesting the maize crop, whether profitable or otherwise, since this has so important a bearing on early ploughing, adequate working of the land and the control of insect pests. It is to be inferred that the writer still views this matter with an open mind, and that there are insufficient data available as yet in the Union to permit of any definite pronouncement.

Mr. Burt Davy's work covers so wide a field, however, that it would be strange indeed were there not some few points open to criticism. Viewed as a whole, "Maize: Its History, Cultivation, Handling and Uses" is without doubt one of the best and most up-to-date works of its kind, and the writer is to be congratulated on producing such a book at a time when it is much needed.

## Correspondence.

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### CITRUS TREES AT PREMIER ESTATE.

Mr. C. E. Farmer, Citrus Adviser to the British South Africa Company, has asked us to publish the following letter addressed to the Editor of the *Rhodesian* in regard to a paragraph appearing in the issue of that paper, dated 8th May, to the following effect:—

“It is rumoured that the 30,000 citrus trees which have been planted on the Premier Estate, and are intended for sale and distribution amongst the local farmers, are severely attacked with scale and bark disease. This is bad news and calls for the immediate attention of the authorities in charge, else what promises to be a flourishing industry will be nipped in the bud.”

‘I notice in your issue of 8th May you publish under the heading, “Bad news about Citrus,” a rumour that 30,000 citrus trees which have been planted on the Premier Estate and intended for sale . . . are severely attacked with scale and bark disease. . . .

I am at present on a visit to the estate, after an absence of about two months, for the purpose of inspecting the progress of the citrus industry being established here. I have closely examined the nursery, which contains, I presume, the 30,000 alluded to, and find no scale of any species present in it.

I am not familiar with any disease known by the vague term of “bark” disease, and I do not know what the above rumour refers to under this name. but I do not find any disease of a serious nature among the trees in this nursery.

The groves on the estate contain trees on which will be found a certain amount of two varieties of the naked scales



(*Lecanium hesperidum* and *Icerya purchasi*). These two pests seem to be indigenous to the country and to be found on citrus trees everywhere in Rhodesia. They are of all the scale species most easy to control with the spray pump.

The black aphid is present on the young growth of trees; this, though very persistent in returning, is destroyed by the mildest forms of wash.

A fungus which has not yet been clearly identified by the Government Entomologist is present on the estate, and to be found in the tissue of the leaf. I find this fungus on citrus trees in all parts of Mashonaland and on all kinds of soil.

I find no other pests or disease in the groves or nursery on the estate, and from the comparatively harmless nature of those I have mentioned I fear no such dire results to the citrus industry as are indicated in the published rumour.

As you must be aware, the establishment of a nursery for the propagation of citrus fruit trees on the Premier Estate is the private enterprise of the Commercial Branch of the British South Africa Company, and as such is subject to the regulations of the Nursery Ordinance, under which it must be inspected periodically by the Government Entomologist, and the sale and distribution of trees disallowed should any pest or disease scheduled in the Ordinance be found on such inspection to exist.

I trust, sir, you will give this letter full publication in your next issue.'

## The Agricultural Outlook.

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The promising conditions obtaining when the report for the April issue of the *Journal* was penned have not been maintained, and the season in many districts can only be termed as extremely disappointing. Throughout the Territory the rains terminated very early in the year, and practically everywhere crops have suffered. There are certain favoured spots where the drought has not been so severely felt, but, generally speaking, the mealie crop will be a short one. Black soil has been the salvation of a number of farmers this year, although on some of the lighter soils thorough cultivation has considerably alleviated the situation. The grass in some districts is already giving out, but it is pleasing to note that most stock owners are now making provision for the winter feeding of their animals, and no longer take the chance of incurring disaster through the vagaries of the weather.

Reports from Marandellas shew that the tobacco crop this season is a poor one, the leaf not ripening properly owing to the absence of rain. Maize and monkey nuts sown on old tobacco lands have done well, and a fair harvest is expected, but wheat and oats sown on similar land are not good.

At Lomagundi, owing to the shortage in the rainfall, the crops are poor, and it is not expected that there will be even half a harvest. Stock are looking well. No rain at all fell in the Hartley district during March, and crops in consequence have suffered considerably. In the vicinity of Hartley and at Makwiro the crops are fair, but south of the Umfuli River the drought has been severely felt. Stock at present are doing very well, but anxious times are anticipated.

Conditions in Matabeleland vary very considerably, but generally the season has been a bad one. At Gwelo the vleilands have cropped well and a medium mealie harvest is expected. Farmers in this district are turning their attention

to buckwheat, which is doing well on sandy loam. All stock are in the very best condition, and up to the present there has been very little horse sickness. In the Bulalima-Mangwe district the prospects of a moderately good season were destroyed by the cessation of the rains in February, and it is estimated that the total harvest will be but an eighth of the normal yield. The veld is parched, and there is considerable anxiety amongst farmers in regard to the feeding and watering of their stock during the ensuing dry months.

Crops in the Gwanda district have, generally speaking, been a failure on account of the absence of rain in March, but stock are doing well, and there is no disease. Grass is plentiful, but water is drying up very fast.



## Veterinary Report.

March, 1914.

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### SALISBURY.

AFRICAN COAST FEVER.—No fresh outbreaks. Another case occurred in one of the infected herds on the Western Commonage.

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### BULAWAYO.

AFRICAN COAST FEVER.—No further cases.

HORSESICKNESS INOCULATION.—Four mules inoculated. No deaths.

MALLEIN TEST.—The following animals were tested on importation, with negative results. Horses, 4; mules, 16; donkeys, 39.

IMPORTATIONS.—From the Union of South Africa: Horses, 4; mules, 16; donkeys, 39; heifers, 341; bulls, 45; sheep and goats, 5,601. From Northern Rhodesia *via* Victoria Falls: Oxen, 20.

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### UMTALI.

AFRICAN COAST FEVER.—Five head were destroyed at N'Odzi, bringing the total mortality to date to 141.

HORSESICKNESS INOCULATION.—Five mules were inoculated. No deaths.

IMPORTATIONS.—Thirty-six head of slaughter cattle were imported *ex* Macequece.

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MELSETTER.

SCAB.—One flock placed in quarantine.

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All other districts reported free from infective disease..

J. M. SINCLAIR,

Chief Veterinary Surgeon.

## Veterinary Report.

April, 1914.

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### SALISBURY.

AFRICAN COAST FEVER.—Existing outbreaks: no further cases. Fresh outbreak: an outbreak occurred amongst a herd of cattle running on the M.T.C. farm, adjoining the Commonage. One case only occurred, and microscopic and *post-mortem* examinations both revealed the disease.

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### BULAWAYO.

AFRICAN COAST FEVER.—Nothing further to report.

MALLEIN TEST.—The following animals were tested with mallein and found free from glanders (Plumtree and Gwanda included):—Horses, 30; mules, 24; donkeys, 205.

IMPORTATIONS.—From England: Heifers, 14; bulls, 6. From the Union of South Africa: Horses, 35; mules, 15; donkeys, 159; heifers, 1,240; bulls, 39; sheep and goats, 5,212. From Northern Rhodesia: Oxen, 108; cows, 185; bulls, 5; calves, 28.

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### UMTALI.

AFRICAN COAST FEVER.—Four head were destroyed at N'Odzi, bringing the total mortality to date to 145. A fresh outbreak occurred in a small herd of cattle in the Penhalonga Valley. One case only occurred which shewed Coast Fever on *post-mortem* examination, which was confirmed microscopically.



A suspicious case occurred on the farm Devonshire. A *post-mortem* examination was held, the microscopic lesions being those of redwater and gallsickness, and in addition there were numerous hepatic abscesses. Spleen and gland smears shewed masses not unlike Koch's bodies, and consequently the herd is being kept under observation. Dipping has been changed from weekly to five days. All the cattle are apparently healthy.

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### GWELO.

MALLEIN TEST.—Four horses were tested with mallein on importation, and found free from glanders.

HORSESICKNESS.—Six horses and one mule reported to have died from this disease.

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Several deaths from horsesickness have been reported from the Umvuma, Selukwe and Enkeldoorn districts. All other districts reported free from disease.

J. M. SINCLAIR,

Chief Veterinary Surgeon.

## Garden Calendar.

June and July.

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By N. L. KAYE-EDDIE.

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### THE FLOWER GARDEN.

During these cold dry months, most plants are at a standstill, and but little growth is made. Watering has to be resorted to in order to keep delicate and small plants alive. The soil should be well dug and manured, and kept constantly stirred and as loose as possible, especially where watering has been done. Seeds of most annuals for early flowering may be sown in boxes, but these will require constant watering before the coming rainy season. The boxes should be placed in a warm place, sheltered from the wind—a good plan is to make a pit and cover the top with calico. Perennials, shrub and ornamental tree seeds may also be sown. Dahlia and other flowering bulbs should be taken up, and stored for division and replanting whilst the soil is being prepared. Fruit trees, shrubs, and roses should be pruned, and all the waste and dead wood removed.

*Sweet Peas* should be well attended to, constantly cultivated, manured and staked. When starting to climb, they should be slightly ridged, which will help to this purpose.

*Carnations*.—No garden should be without this very popular and beautiful flower. The Marguerite varieties flourish especially well in Rhodesia, and with attention will flower throughout the year. They are easily raised from seed or cutting, and grow in almost any situation. Constant picking and not allowing seed to form adds to their life and vigour.

*Dahlias*.—The bulbs should be broken up and replanted. Care should be exercised in this operation, which is a difficult

one. Each bulb to grow must have an eye, which is situated on the crown of the old stem, part of which must be cut away with each bulb; the thin neck of the bulb should in no way be damaged. The dahlia requires only a poor but deep soil, and should never be heavily manured, or the plant will run to wood. The cactus varieties do exceedingly well in this country.

All plants in tins or pots requiring repotting should now be attended to. A good compost can be made of ordinary garden soil, sand, and leaf mould in equal parts, and, where specially required, a little well-rotted manure may be added. Rotten chips under the wood stack will do instead of leaf mould.

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### THE VEGETABLE GARDEN.

All the available space in the garden should now be thoroughly trenched and manured, the soil being well worked and loosened. Vegetables planted out for winter crops should be well and continuously cultivated, which will help to bring them along quicker and with less watering. Late-bearing tomatoes should be sheltered from the cold winds by a grass shield. Beans should be staked and tied. Beet, radish, carrot, parsnip, turnip, onion, leek, mustard, cress, and tomatoes may be planted. Potatoes may be planted by those who are fortunate enough to have sufficient water.



## Market Reports.

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The produce markets at Bulawayo and Salisbury are well supplied with all lines. There are ample supplies of mealies, and, as far as Mashonaland is concerned, the incoming crop is expected to be sufficient to meet requirements.

There has been a number of stock sales during the last two months, and prices generally have been good. At Mr. G. W. Pott's sale at Figtree on the 11th April, milk cows realised £17 to £25; breeding stock, cows and heifers, £7 5s. to £11; slaughter oxen, £9 to £11; trek oxen, £8 10s. to £9; young oxen, £6 to £7 10s; and bulls, £10 to £30. At the Marandellas Trading Company's sale, on the 2nd May, slaughter oxen were sold at 40s. per 100 lbs.; trek oxen £7 5s. to £9 10s.; Mashona cows, with calves, £8 10s.; Mashona cows, £7 5s.; half-bred cows, £10 10s. to £15; and colonial heifers, £8 10s. At Messrs. Whitfield's sale at Eldorado, on 27th and 28th May, the prices were: Angoni cows, £6 10s. to £8 5s.; half-bred Aberdeen Angus heifers, about three years old, £11 5s. to £13; half-bred Aberdeen Angus bullocks, about three years old, £8 7s. 6d; Mashona heifers, from twelve to eighteen months, £4 to £4 17s. 6d.; Mashona heifers, two to three years old, £5 10s. to £6 10s.; slaughter bullocks, 35s. per 100 lbs.

| Article.                         | Johannesburg. |      | Kimberley. |      | Bulawayo. |      | Salisbury. |      |
|----------------------------------|---------------|------|------------|------|-----------|------|------------|------|
| Barley, 150 lbs.                 | 9/0           | 9/6  | 10/0       | 11/6 | 24/0      | 26/6 | 24/0       | 25/0 |
| Beans, 203 lbs.                  | 16/0          | 36/0 | 20/0       | 25/6 | 28/0      | 30/0 | 12/6       | 20/0 |
| Boer Meal, unsifted,<br>200 lbs. | —             | —    | —          | —    | 38/0      | 40/0 | 37/6       | —    |
| Bran, wheaten, 100 lbs.          | 6/9           | 7/9  | 7/6        | 8/0  | 12/0      | 13/6 | 15/0       | 16/0 |
| Flour, 100 lbs.                  | —             | —    | —          | —    | 20/0      | 22/6 | 17/6       | 23/0 |
| „ Colonial, 100 lbs.             | —             | —    | —          | —    | —         | —    | —          | —    |
| Forage, 100 lbs.                 | 3/6           | 4/9  | 4/9        | 5/6  | 9/0       | 10/0 | 6/6        | —    |
| „ Colonial Oat                   | —             | —    | —          | —    | —         | —    | —          | —    |
| Hay                              | 6d.           | 10d. | —          | —    | 60/0      | 70/0 | 45/0       | 50/0 |
| Kaffir Corn, 200 lbs.            | 8/6           | 10/6 | 10/0       | 11/0 | 16/0      | 18/0 | 12/0       | 12/6 |
| Manna, 100 lbs.                  | 3/3           | 3/9  | —          | —    | —         | —    | —          | —    |
| Mealies, S.A. White,<br>203 lbs. | 6/6           | 8/10 | 8/6        | 11/6 | 12/6      | 13/6 | 9/6        | 10/0 |
| Mealies, Yellow, 203 lbs.        | 6/0           | 8/0  | 8/6        | 10/6 | 12/0      | 13/0 | —          | —    |
| Mealie Meal, White,<br>183 lbs.  | —             | —    | 10/0       | 10/6 | 12/0      | 13/0 | 9/6        | 10/0 |
| Munga, 200 lbs.                  | —             | —    | —          | —    | 17/0      | 18/0 | 13/6       | —    |
| Monkey Nuts, bag                 | 9/0           | —    | —          | —    | 10/0      | 11/0 | 7/6        | —    |
| Oats, 150 lbs.                   | 6/9           | 7/6  | 10/0       | 10/6 | 17/0      | 18/0 | 25/0       | —    |
| Onions, 120 lbs.                 | 10/0          | 12/6 | 5/0        | 10/0 | 17/6      | 18/0 | 20/0       | —    |
| Peas, 200 lbs.                   | 21/0          | 23/0 | —          | —    | —         | —    | —          | —    |
| Potatoes, new, 150 lbs.          | 12/0          | 15/0 | 10/0       | 17/6 | 16/0      | 17/0 | 9/0        | 10/0 |
| „ old, 150 lbs.                  | 5/0           | 10/0 | —          | —    | —         | —    | —          | —    |
| Rapoko                           | —             | —    | —          | —    | 15/0      | 16/0 | 10/6       | 11/0 |
| Rye, 200 lbs.                    | 16/0          | 17/0 | —          | —    | —         | —    | 20/0       | —    |
| Salt, 200 lbs.                   | 4/0           | 4/4  | 3/0        | 4/0  | 9/0       | 10/0 | 11/6       | —    |
| Wheat, 203 lbs.                  | 21/0          | 22/6 | 21/0       | 21/6 | 35/0      | 38/0 | 27/0       | 28/0 |
| Butter, local, per lb.           | 10d.          | 1/3  | 10½d.      | 1/4  | 2/0       | 2/6  | 2/0        | 2/3  |
| Eggs, local, per dozen           | 1/0           | 1/6  | 1/6        | 1/9  | 4/0       | 4/6  | 3/6        | 4/0  |
| Ducks, each                      | 1/6           | 2/9  | 2/0        | 3/3  | 3/6       | 4/6  | 3/6        | 4/6  |
| Fowls, each                      | 1/0           | 2/0  | 1/0        | 2/0  | 2/3       | 3/3  | 2/0        | 3/6  |
| Geese, each                      | 2/9           | 3/9  | —          | —    | 7/6       | 8/0  | 9/0        | 11/0 |
| Turkeys, cocks, each             | 5/0           | 13/6 | —          | —    | 10/0      | 15/0 | 15/0       | 17/6 |

## LIVE STOCK.

|                            |        |       |       |        |       |      |        |        |
|----------------------------|--------|-------|-------|--------|-------|------|--------|--------|
| Slaughter Cattle, 100 lbs. | £6     | £13   | —     | —      | 35/0  | 45/0 | 35/0   | 37/6   |
| Trek Oxen, trained         | £7     | £8/10 | £7    | £8     | £8/10 | £10  | £9     | £10/10 |
| Local Cows, milk           | —      | —     | —     | —      | —     | —    | —      | —      |
| Dairy Cows                 | £20    | £30   | £20   | £27/10 | £25   | £35  | £25    | £30    |
| Native Cows                | —      | —     | —     | —      | £7    | £9   | £8     | £9/10  |
| Heifers, Colonial          | £5     | £6    | £6    | £8     | £8    | £10  | £8     | £9     |
| „ Native                   | —      | —     | —     | —      | £6    | £7   | £6     | £7     |
| Pigs, live weight          | 2d.    | 4½d.  | 3d.   | 4d.    | 4d.   | —    | 4d.    | —      |
| Horses, riding, salted     | —      | —     | —     | —      | £30   | £40  | £35    | £45    |
| „ „ unsalted               | £15    | £20   | £10   | £25    | £20   | £30  | £25    | £30    |
| Mules, inoculated          | £17/10 | £25   | £15   | £25    | £25   | £35  | £22/10 | £30    |
| Donkeys, geldings          | £4     | £5/5  | £4/10 | £6/10  | £5    | £6   | £5     | £6/10  |
| „ mares                    | —      | —     | £5    | £7     | £6/10 | £8   | £7     | £8/10  |
| Goats                      | 9/0    | 15/0  | —     | 12/6   | 15/0  | 17/6 | 12/6   | 15/0   |
| Persian Ewes               | —      | —     | —     | —      | 20/0  | 25/0 | 20/0   | 21/0   |
| Cross-bred Ewes            | 12/0   | 18/0  | —     | —      | 19/0  | 21/0 | 18/0   | £1     |
| Sheep, slaughter           | —      | —     | 12/6  | 16/0   | 21/0  | 25/0 | 22/6   | 25/0   |

## Lane's Produce Mart, Port Elizabeth.

15TH MAY, 1914.

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WOOL.—The catalogue sale took place to-day, when out of 1,600 bales offered 750 were sold. The not-solds consisted chiefly of snow whites. Generally speaking, the wool market is extremely firm, and prices bid on to-day's market were very good. The season is now drawing to a close, and even the heavier descriptions are now meeting with more competition. We think that these wools will eventually be sold at better figures than we have had bid in the first case.

MOHAIR.—*Summer Kids*.—There is practically very little doing, the demand for same having fallen off somewhat, and prices have dropped considerably. We have fortunately been able to dispose of most of ours, but to-day the best price obtainable is from 25d. to 26d. Mixed kids are selling on about the same basis as last week. The demand for this article is also very restricted.

*Summer Firsts*.—Although there is nothing doing at all in this article, the undertone seems to be much better than it was, and we shall not be surprised to see a fair amount of business doing next or the following week.

Ordinary mixed hair on to-day's market, if anything, was in slightly better demand than it has been for some time, and is selling at full rates. Back country hair, on the other hand, buyers do not seem to want, in that it is of such light, flimsy description, and does not seem to interest them at all.

SKINS.—The market for skins this week remains unchanged. If anything, Cape skins are slightly weaker, but so far there is no change in prices.

HIDES.—On the other hand the London sales have established a downfall of fully  $\frac{1}{4}$ d., and we have to reduce our prices accordingly.



# Weather Bureau.

## TEMPERATURES.

| STATION                                | MARCH     |           | APRIL     |           |
|--|-----------|-----------|-----------|-----------|
|  | Mean Max. | Mean Min. | Mean Max. | Mean Min. |
| <b>MASHONALAND—</b>                    |           |           |           |           |
| Hartley, Gatooma ...                   | 88·60     | 60·03     | 87·1      | 58·8      |
| „ Giant Mine ...                       | 85·84     | 61·26     | 84·7      | 59·20     |
| „ Hallingbury Farm ...                 | 85·90     | 57·50     | 84·7      | 55·20     |
| Lomagundi, Eldorado Mine ...           | 88·80     | 62·51     | 86·43     | 61·56     |
| „ Kanyemba ...                         | —         | —         | —         | —         |
| „ Sinoia ...                           | —         | —         | —         | —         |
| „ Sipolilo ...                         | —         | —         | 83·11     | 60·8      |
| Makoni, River Junction ...             | —         | —         | —         | —         |
| Mazoe, Shamva Mine ...                 | 85·25     | 62·06     | 83·14     | 60·87     |
| Melsetter ...                          | 73·80     | 50·70     | 74·70     | 48·70     |
| „ Mount Selinda ...                    | —         | —         | —         | —         |
| „ Vermont ...                          | —         | —         | —         | —         |
| Salisbury, Agricultural Laboratory ... | —         | —         | —         | —         |
| „ Chishawasha ...                      | 81·8      | 55·90     | 80·5      | 54·7      |
| „ The Gaol... ...                      | 85·0      | 57·20     | 82·8      | 57·0      |
| Umtali, Chiconga's Location ...        | 80·70     | 58·50     | —         | —         |
| „ Public School ...                    | 80·30     | 59·70     | 81·10     | 60·14     |
| Victoria ...                           | 81·13     | 54·51     | 82·16     | 56·73     |
| <b>MATABELELAND—</b>                   |           |           |           |           |
| Bulawayo, Essexvale ...                | 83·90     | 58·40     | 84·86     | 58·03     |
| „ Observatory ...                      | 81·0      | 58·30     | —         | —         |
| „ Rhodes Matopo Park... ..             | 83·80     | 58·32     | —         | —         |
| Gwelo, The Gaol ...                    | —         | —         | —         | —         |
| Mangwe, Empandeni ...                  | 86·60     | 48·40     | 88·42     | 45·24     |
| Tuli ...                               | —         | —         | 99·90     | 63·30     |
| Wankie, The Hospital ...               | 92·16     | 68·41     | 94·00     | 66·53     |
| Victoria Falls ...                     | —         | —         | 91·90     | 56·00     |

## RAINFALL.

| STATION              | March | April |
|----------------------|-------|-------|
| <b>MASHONALAND :</b> |       |       |
| Charter—             |       |       |
| Driefontein ...      | 0·23  | 0·46  |
| Enkeldoorn ...       | Nil   | —     |
| Grootfontein ...     | 0·43  | —     |
| Marshbrook ...       | 0·03  | 0·02  |
| The Range ...        | 0·46  | 0·30  |
| Riversdale ...       | Nil   | 0·34  |
| Umvuma (Railway) ... | Nil   | —     |

## RAINFALL—(Continued).

| STATION                   |     |     | March | April |
|---------------------------|-----|-----|-------|-------|
| MASHONALAND—(Continued)   |     |     |       |       |
| Hartley—                  |     |     |       |       |
| Ardgowan                  | ... | ... | Nil   | 0·32  |
| Battlefields (Railway)    | ... | ... | Nil   | —     |
| Beatrice Mine             | ... | ... | —     | —     |
| Carnock Farm              | ... | ... | 0·08  | 0·59  |
| Norton Siding             | ... | ... | 0·36  | 1·52  |
| Elvington                 | ... | ... | 0·02  | 0·30  |
| Franceys                  | ... | ... | 0·02  | 1·04  |
| Gatooma                   | ... | ... | 0·04  | 0·20  |
| Gatooma (Railway)         | ... | ... | Nil   | —     |
| Giant Mine                | ... | ... | 1·33  | 1·43  |
| Gowerlands                | ... | ... | 0·10  | 0·73  |
| Hallingbury               | ... | ... | 0·14  | 0·46  |
| Hartley (Railway)         | ... | ... | Nil   | —     |
| M'pofhoe                  | ... | ... | —     | —     |
| “Jenkinstown”             | ... | ... | 0·12  | 1·90  |
| Makwiro                   | ... | ... | 0·63  | 0·63  |
| Shagari                   | ... | ... | 0·20  | 0·43  |
| “Stoneygate”              | ... | ... | —     | —     |
| Lomagundi—                |     |     |       |       |
| Banket Junction (Railway) | ... | ... | Nil   | 1·24  |
| Darwendale                | ... | ... | Nil   | —     |
| Duxbury Farm              | ... | ... | 0·54  | 1·19  |
| Eldorado Mine             | ... | ... | 0·66  | 1·17  |
| „ (Railway)               | ... | ... | 0·55  | —     |
| Golden Kopje Mine         | ... | ... | 0·42  | 0·56  |
| Kanyemba                  | ... | ... | 1·65  | 3·98  |
| Longmead                  | ... | ... | 0·10  | 1·44  |
| Palm Tree Farm            | ... | ... | 0·39  | 0·62  |
| Sinoia                    | ... | ... | —     | —     |
| Sipolilo                  | ... | ... | —     | 1·96  |
| Umvukwe Ranche            | ... | ... | —     | 2·51  |
| Makoni—                   |     |     |       |       |
| Chimbi Source             | ... | ... | 1·86  | 0·42  |
| Eagle's Nest              | ... | ... | 0·79  | 0·47  |
| Ellavale                  | ... | ... | 1·74  | 0·50  |
| Inyanga                   | ... | ... | 2·98  | 1·22  |
| Mona                      | ... | ... | 2·29  | —     |
| Monte Cassino Mission     | ... | ... | 0·62  | 1·91  |
| Odzi (Railway)            | ... | ... | 2·50  | 0·93  |
| River Junction            | ... | ... | —     | —     |
| Rusape (Railway)          | ... | ... | 2·64  | —     |
| Springs                   | ... | ... | 1·41  | 0·45  |
| St. Trias' Hill           | ... | ... | 5·64  | 1·09  |
| York Farm                 | ... | ... | 4·23  | —     |
| Mangwendi—                |     |     |       |       |
| Bonongwe                  | ... | ... | 0·22  | —     |
| Glen Somerset             | ... | ... | 1·10  | 0·47  |
| Land Settlement Farm      | ... | ... | 0·62  | —     |
| Macheke (Railway)         | ... | ... | 1·28  | 0·36  |
| Marandellas               | ... | ... | 0·72  | —     |

## RAINFALL—(Continued).

| STATION                           |     |     |     | March | April |
|-----------------------------------|-----|-----|-----|-------|-------|
| MASHONALAND—(Continued)           |     |     |     |       |       |
| Mangwendi (Continued)             |     |     |     |       |       |
| Marandellas (Railway)             | ... | ... | ... | 0·65  | —     |
| Mrewa                             | ... | ... | ... | —     | —     |
| Mungo                             | ... | ... | ... | Nil   | 0·34  |
| Rusawi Outspan                    | ... | ... | ... | 0·18  | —     |
| Selous Nek                        | ... | ... | ... | 0·53  | 0·51  |
| Tweedjan                          | ... | ... | ... | 0·80  | 0·25  |
| Mazoe—                            |     |     |     |       |       |
| Avonduur                          | ... | ... | ... | 0·01  | 1·63  |
| Bindura                           | ... | ... | ... | 0·69  | —     |
| Bindura (Railway)                 | ... | ... | ... | 0·41  | 1·56  |
| Ceres                             | ... | ... | ... | 0·30  | 1·23  |
| Chipoli                           | ... | ... | ... | 0·54  | —     |
| Claverhill                        | ... | ... | ... | 0·05  | 1·90  |
| Darwin                            | ... | ... | ... | 0·26  | 1·84  |
| Dunmaglas                         | ... | ... | ... | 0·25  | 2·34  |
| Laguaha                           | ... | ... | ... | —     | —     |
| Lowdale                           | ... | ... | ... | —     | 0·36  |
| Mazoe                             | ... | ... | ... | Nil   | 3·38  |
| Mguta Valley                      | ... | ... | ... | 0·17  | 1·55  |
| Omeath                            | ... | ... | ... | 0·12  | —     |
| Ruia                              | ... | ... | ... | 0·10  | —     |
| Shamva                            | ... | ... | ... | —     | —     |
| „ Mine                            | ... | ... | ... | 0·51  | 3·67  |
| Sunnyside                         | ... | ... | ... | 0·11  | 2·09  |
| Teign                             | ... | ... | ... | 0·30  | 2·31  |
| Umvukwe Flats                     | ... | ... | ... | Nil   | 2·63  |
| Waterfall Farm                    | ... | ... | ... | —     | —     |
| Melsetter—                        |     |     |     |       |       |
| Chipinga                          | ... | ... | ... | 5·76  | 0·86  |
| Helvetia                          | ... | ... | ... | 6·76  | 3·89  |
| Melsetter                         | ... | ... | ... | 10·99 | 1·06  |
| Mount Selinda                     | ... | ... | ... | 13·18 | 1·73  |
| Mutambara Mission                 | ... | ... | ... | 2·64  | 0·28  |
| Pasture                           | ... | ... | ... | 2·62  | 0·05  |
| Tom's Hope                        | ... | ... | ... | 1·94  | 1·18  |
| Vermont                           | ... | ... | ... | —     | —     |
| Salisbury—                        |     |     |     |       |       |
| Avondale                          | ... | ... | ... | 0·13  | 0·92  |
| Brookmead                         | ... | ... | ... | 0·12  | —     |
| Chishawasha                       | ... | ... | ... | 0·56  | —     |
| Cleveland Reservoir               | ... | ... | ... | 0·12  | 0·71  |
| Convent                           | ... | ... | ... | —     | —     |
| Goromonzi                         | ... | ... | ... | 1·15  | 0·53  |
| Gwibi                             | ... | ... | ... | —     | —     |
| Lilfordia                         | ... | ... | ... | —     | —     |
| Meadows                           | ... | ... | ... | 1·65  | —     |
| Salisbury Agricultural Laboratory | ... | ... | ... | —     | —     |
| „ (Club)                          | ... | ... | ... | 0·11  | 0·92  |
| „ (Gaol)                          | ... | ... | ... | 0·24  | 0·95  |



RAINFALL (*Continued*).

| STATION                 |     |     |     | March | April |
|-------------------------|-----|-----|-----|-------|-------|
| MASHONALAND—(Continued) |     |     |     |       |       |
| Salisbury (Continued)   |     |     |     |       |       |
| Salisbury (Railway)     | ... | ... | ... | 0·15  | —     |
| Sebastopol              | ... | ... | ... | 0·42  | —     |
| Selby                   | ... | ... | ... | —     | —     |
| Westridge               | ... | ... | ... | 0·13  | 0·85  |
| Umtali—                 |     |     |     |       |       |
| Chiconga's Location     | ... | ... | ... | 1·55  | —     |
| Hanyanya (Bikita)       | ... | ... | ... | —     | —     |
| Odzani                  | ... | ... | ... | 4·72  | 0·86  |
| Penhalonga              | ... | ... | ... | 4·82  | 3·15  |
| Premier Estate          | ... | ... | ... | 2·59  | 0·42  |
| Public School           | ... | ... | ... | 3·32  | 0·87  |
| Stralsund               | ... | ... | ... | 4·30  | 1·02  |
| Summerfield             | ... | ... | ... | 3·99  | 0·81  |
| Umtali (Railway)        | ... | ... | ... | —     | —     |
| Victoria—               |     |     |     |       |       |
| Chibi                   | ... | ... | ... | 1·27  | 0·45  |
| Chilimanzi              | ... | ... | ... | —     | —     |
| Chingombe               | ... | ... | ... | 0·55  | 0·45  |
| Chiredzi Rancho, Ndanga | ... | ... | ... | 1·58  | 0·52  |
| Clipsham                | ... | ... | ... | 1·24  | —     |
| Gokomere                | ... | ... | ... | 1·17  | 0·47  |
| Gutu                    | ... | ... | ... | 0·55  | 0·77  |
| Makorsi River Rancho    | ... | ... | ... | 2·14  | 1·05  |
| Marthadale              | ... | ... | ... | 2·70  | 0·85  |
| Morgenster              | ... | ... | ... | 4·16  | 0·58  |
| Noeldale                | ... | ... | ... | 0·67  | 1·53  |
| Pamushana               | ... | ... | ... | 5·61  | —     |
| Silver Oaks             | ... | ... | ... | 0·80  | 0·56  |
| Victoria                | ... | ... | ... | 1·24  | 0·47  |
| MATABELELAND :          |     |     |     |       |       |
| Belingwe—               |     |     |     |       |       |
| Anglo-French Block      | ... | ... | ... | 0·86  | 0·17  |
| Filabusi                | ... | ... | ... | 0·73  | 0·22  |
| Fort Rixon              | ... | ... | ... | 0·34  | 0·24  |
| Infiningwe              | ... | ... | ... | 0·45  | —     |
| Insiza (Railway)        | ... | ... | ... | 0·19  | —     |
| Shangani (Railway)      | ... | ... | ... | 0·12  | —     |
| Tamba                   | ... | ... | ... | 0·06  | —     |
| Thornville              | ... | ... | ... | 1·20  | —     |
| Bubi—                   |     |     |     |       |       |
| Inyati                  | ... | ... | ... | 0·47  | Nil   |
| Leighton                | ... | ... | ... | 0·35  | —     |
| Lechard Experiment Farm | ... | ... | ... | 0·33  | Nil   |
| Bulalima—               |     |     |     |       |       |
| Figtree                 | ... | ... | ... | 0·13  | 0·11  |
| Mholi (late Magot)      | ... | ... | ... | 0·29  | 0·27  |
| Marula                  | ... | ... | ... | —     | —     |
| Solusi                  | ... | ... | ... | 0·07  | 0·04  |
| Syringa                 | ... | ... | ... | Nil   | Nil   |

RAINFALL (*Continued*).

| STATION                     |     |     | March | April |
|-----------------------------|-----|-----|-------|-------|
| MATABELELAND—(Continued)    |     |     |       |       |
| Bulawayo—                   |     |     |       |       |
| Balla Balla (Railway)       | ... | ... | 0·52  | —     |
| Bembesi (Railway)           | ... | ... | 0·09  | —     |
| Braemar                     | ... | ... | 0·26  | —     |
| Essexvale                   | ... | ... | 0·55  | 0·04  |
| Gwaai (Railway)             | ... | ... | 0·52  | —     |
| Heany Junction (Railway)    | ... | ... | 0·29  | —     |
| Hope Fountain               | ... | ... | 0·65  | —     |
| Imbesu Kraal                | ... | ... | —     | —     |
| Keendale                    | ... | ... | 0·18  | 0·18  |
| Khami                       | ... | ... | 0·04  | 0·03  |
| Lower Rangemore             | ... | ... | 0·03  | 0·51  |
| Matopo Mission              | ... | ... | 0·54  | —     |
| Maxim Hill                  | ... | ... | 0·09  | —     |
| Melinakanda Junction        | ... | ... | Nil   | —     |
| Nyamandhlovu (Railway)      | ... | ... | 0·13  | —     |
| Observatory                 | ... | ... | 0·15  | —     |
| Pendennis                   | ... | ... | 0·06  | 0·51  |
| Raylton                     | ... | ... | —     | —     |
| Rhodes Matopo Park          | ... | ... | 0·06  | —     |
| Umgusa                      | ... | ... | —     | —     |
| Umkien                      | ... | ... | —     | —     |
| Gwanda—                     |     |     |       |       |
| Antelope Mine               | ... | ... | 0·37  | 0·01  |
| Gwanda (Caol)               | ... | ... | 0·07  | 0·11  |
| „ (Railway)                 | ... | ... | 0·09  | 0·25  |
| Malundi                     | ... | ... | 0·32  | 0·18  |
| Mtshabzi Mission            | ... | ... | 0·26  | 0·14  |
| West Nicholson (Railway)    | ... | ... | 0·25  | —     |
| Gwelo—                      |     |     |       |       |
| Globe and Phoenix (Railway) | ... | ... | Nil   | —     |
| Gwelo (Gaol)                | ... | ... | 0·16  | 0·33  |
| Gwelo (Railway)             | ... | ... | Nil   | —     |
| Lalapanzi                   | ... | ... | 0·39  | 0·34  |
| Lochiel                     | ... | ... | Nil   | 0·30  |
| Lower Gwelo                 | ... | ... | 0·14  | Nil   |
| Que Que                     | ... | ... | Nil   | —     |
| Rhodesdale Estate           | ... | ... | Nil   | 0·26  |
| Selukwe (Railway)           | ... | ... | 1·16  | —     |
| Shangani                    | ... | ... | —     | —     |
| Shawlands                   | ... | ... | —     | —     |
| Sheltered Vale              | ... | ... | 0·13  | 0·13  |
| Sikombela                   | ... | ... | 0·04  | —     |
| Mafungabusi—                |     |     |       |       |
| Inyoka                      | ... | ... | 0·38  | —     |
| Mangwe—                     |     |     |       |       |
| Empandeni                   | ... | ... | —     | —     |
| Garth                       | ... | ... | 0·12  | 0·30  |

RAINFALL (*Continued*)

| STATION                  |     |     |     | March | April |
|--------------------------|-----|-----|-----|-------|-------|
| MATABELELAND—(Continued) |     |     |     |       |       |
| Tuli—                    |     |     |     |       |       |
| Lamulas                  | ... | ... | ... | Nil   | 0·40  |
| Langalanga               | ... | ... | ... | Nil   | 2·10  |
| Makalali                 | ... | ... | ... | Nil   | 1·30  |
| Manantji                 | ... | ... | ... | Nil   | —     |
| Manyoni                  | ... | ... | ... | 0·20  | 4·07  |
| Mazunga                  | ... | ... | ... | 0·03  | —     |
| Tuli                     | ... | ... | ... | 0·08  | 1·98  |
| Wankies—                 |     |     |     |       |       |
| Malindi (Railway)        | ... | ... | ... | 0·85  | —     |
| Victoria Falls           | ... | ... | ... | 2·98  | —     |
| Victoria Falls (Railway) | ... | ... | ... | 2·24  | —     |
| Wankies Hospital         | ... | ... | ... | 1·31  | 1·14  |
| Wankies (Railway)        | ... | ... | ... | 1·52  | —     |

— No return.



# Dates of Meetings of Farmers' Associations, Southern Rhodesia

(SUBJECT TO ALTERATION)

DATES OF MEETINGS OF FARMERS' ASSOCIATIONS.

785

| Name of Association                   |    | Place of Meeting                  | Secretary            | 1914           |      |        |
|---------------------------------------|----|-----------------------------------|----------------------|----------------|------|--------|
|                                       |    |                                   |                      | June           | July | August |
| Bindura                               | .. | Bindura                           | A. M. Robb           | ..             | 10   | ..     |
| Charter-Mgezi                         | .. | Beatrice Mine                     | W. Krienke           | ..             | 29   | ..     |
| Central                               | .. | Umvuma                            | N. Dainty            | 26             | 31   | 28     |
| Enterprise                            | .. | Areturus Hotel                    | J. Watson            | 9              | 14   | 11     |
| Figtree Branch, R.L. and F.A.         | .. | Figtree Station                   | A. Curtis            | ..             | ..   | 1      |
| Gatooma                               | .. | Gatooma                           | ..                   | 20             | 18   | 15     |
| Gazaland                              | .. | Chipinga                          | W. Wood              | ..             | 30   | ..     |
| Grey stone                            | .. | Roodelheuvel, Shangani            | J. W. Spencer        | 13             | 11   | 8      |
| Hartley                               | .. | Hartley                           | H. Savory            | 6              | 11   | 8      |
| Headlands                             | .. | Headlands                         | H. Barnes Pope       | 13             | 25   | ..     |
| Hunter's Road Farmers and Stockowners | .. | Hunter's Road Siding              | R. W. Twilley        | ..             | 11   | 8      |
| Insiza                                | .. | Insiza Station Hotel              | N. C. St. J. Breslin | 13             | 4    | ..     |
| Iron Mine Hill Proper                 | .. | Crossmaloo Farm                   | A. B. M. Harwood     | 19             | 11   | 21     |
| Lalapanzani and Iron Mine Hill        | .. | Iron Mine Hill and Lalapanzi alt. | Cyril Allen          | 20             | 17   | 15     |
| Lomagundi                             | .. | Sinoia                            | W. Abbot             | ..             | 18   | ..     |
| Macheke                               | .. | Macheke                           | H. H. Kidson         | 19             | 4    | 21     |
| Makwiro                               | .. | Makwiro                           | F. R. McLellan       | 6              | 4    | 1      |
| Marandellas                           | .. | Marandellas Farmers' Hall         | E. P. de Kock        | ..             | 1    | ..     |
| Mangwendi                             | .. | Fixed every meeting               | Luke Green           | 6              | 4    | 1      |
| Makoni                                | .. | Rusape                            | J. A. Tapson         | 27             | 25   | 22     |
| Marula                                | .. | Marula Siding                     | MacW. Ingram         | 13             | 11   | 8      |
| Mashonaland                           | .. | Commercial Hotel, Salisbury       | W. H. Williamson     | 10             | 8    | ..     |
| Matopo Branch, R.L. and F.A.          | .. | Malundi Hotel                     | W. Bathurst          | ..             | ..   | ..     |
| Mazoe                                 | .. | Glendale Siding                   | F. C. Peek           | 6              | 11   | 8      |
| Melsetter (North)                     | .. | Various farms                     | Rev. R. Wodehouse    | 13             | 4    | ..     |
| Midlands                              | .. | Gwelo                             | J. F. Ward           | ..             | 11   | ..     |
| Northern                              | .. | Farm "Summerfield"                | R. V. H. Blurton     | 13             | 4    | ..     |
| Phuntree                              | .. | Phuntree                          | H. J. Brooke         | 20             | 11   | 8      |
| Que Que                               | .. | Globe and Phoenix Hotel           | E. E. Somerset       | 26             | 18   | 15     |
| Rhodesian Landowners and Farmers      | .. | Library Buildings, Bulawayo       | H. S. Hopkins        | ..             | 31   | 28     |
| Shamva                                | .. | Shamva                            | J. M. Moubray        | No dates fixed | 5    | 2      |
| Southern Insiza                       | .. | Peggy Hotel, Insiza               | W. J. B. Harris      | 7              | ..   | ..     |
| Selukwe                               | .. | Selukwe Hotel                     | F. S. Clark          | No dates fixed | 5    | ..     |
| Somabula and Shangani Flats           | .. | Fairview                          | G. B. Botha          | 6              | ..   | ..     |
| Umvukwe                               | .. | Gomo                              | Hon. J. S. Parker    | 6              | 4    | 1      |
| Umtali                                | .. | Christmas Pass Hotel              | J. S. Holland        | 17             | 15   | 19     |
| Victoria                              | .. | Victoria                          | H. S. Hoatson        | 14             | 11   | ..     |
| Vungu                                 | .. | Vungu                             | J. H. Erasmus        | ..             | ..   | ..     |

## Departmental Notices.

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### Information for Farmers

The Department of Agriculture is prepared to furnish to farmers technical advice either by correspondence, or, where possible, by personal visits. All communications should be addressed in the first instance to the Director of Agriculture.

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### Crops

The Agricultural Branch deals with enquiries relating to agricultural practice, soils, crops, cultural operations, processes, seeds, trees, farm implements and machinery, etc.

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### Disposal of Pure Seed.

Farmers devoting special attention to the production of pure seed of any locally grown crops are invited to communicate with the Government Agriculturist, and at the same time to submit a  $\frac{1}{4}$  lb. sample of any seed which they may have for disposal.

In addition to indicating the total amount of seed offered and the price f.o.r. the nearest railway station or siding, the correct name of the variety and the origin of the seed from which the crop was grown should be given. In the case of special attention having been devoted to seed selection, the methods employed should be described.

Where these stipulations are complied with, and the samples forwarded are deemed by the Agriculturist of sufficiently high quality for seed purposes, growers and intending purchasers will be put in touch with one another. It is hoped by this means to encourage the production of pure seed, and growers are urged whenever possible to sell their seed under guarantee of trueness to name, type and sample deposited with the Department.

After placing growers and would-be purchasers in touch with one another, the Department can accept no further responsibility except in the position of adjudicator when bulk

supplies are thought inferior to sample and description, in which case both parties will be required to abide by the decision of the Department.

For further particulars see article on Pure Seed Supply, *Rhodesia Agricultural Journal*, February, 1914.

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### **Poisonous Plants**

It is of great importance that as soon as possible a study should be made of those plants found in Southern Rhodesia which are poisonous or deleterious to small or large stock. Farmers and others who have known, or suspected poisonous plants on their property, are requested to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, at the same time forwarding specimens of the plant, including stem, leaves, flowers, and, where possible, fruit. Any particular regarding the habits of the plant will be welcomed, and in return the Department will supply all available information regarding the plants.

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### **Tobacco**

The services of the Tobacco Expert are available to all desiring advice on the subject. Applications should be accompanied by particulars of the nature of the information sought, also the distance and direction of the farm from some well known centre.

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### **Live Stock**

The Animal Industry Branch is prepared to advise with regard to all matters connected with stock breeding, selection feeding and registration of stud animals, the dairy industry, poultry management, farm buildings for stock, and kindred subjects. Buyers and sellers of stud stock in Rhodesia are also put in touch with one another.

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### **Entomology**

The Government Entomologist advises on matters connected with insect pests of live stock, crops, and fruit trees, and also undertakes the inspection of nurseries and of the importation of plants from abroad.



## Chemical Analyses

The Government Agricultural Chemist deals with matters relating to the composition of soils, fertilisers, farm produce of vegetable or animal origin; also the investigation of poisons and of articles of potential economic value.

Nominal charges are made, which, while not covering the cost, will help to defray the expense and serve as a proof of good faith. Samples, carriage prepaid, together with full particulars regarding the subject should be addressed to the Agricultural Chemist, Department of Agriculture, Salisbury.

A schedule of charges and directions for taking samples will be furnished on application.

With all analyses, reports will be furnished explanatory of the results and, when possible, advice given as to the nature, properties and value of the material.

No charge will be made for analysis where the material forwarded is considered by the Director of Agriculture and Chemist to be of sufficient general interest.

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## Services of Government Veterinary Surgeons

1. The services of Government Veterinary Surgeons are available to the public, free of charge, for the following purposes only :—

- (1) Attending and giving professional advice in connection with the following diseases, viz. :—Anthrax, Contagious abortion, East Coast Fever, Epizootic Lymphangitis, Foot and Mouth Disease, Farcy, Foot-rot, Heartwater, Glanders, Intestinal parasites amongst sheep and goats, Liver Disease, Lungsickness, Osteo Porosis, Malarial Catarrhal Fever (blue tongue), Rabies, Redwater, Rinderpest, Scabies, Sponziekte (quarter evil), Swine Fever, and any other diseases which may in future be scheduled in terms of section 3, sub-section 18 of the "Animals Diseases Consolidation Ordinance, 1906." Attending to cases of disease amongst live stock which, though not of a contagious or infectious character, may be of general public importance.

- (2) Applying tests in regard to Glanders, Tuberculosis, or any other disease against the introduction or spread of which tests are applied under regulations.
- (3) Inoculations against the following diseases :—  
Horsesickness, Lungsickness, Anthrax, Quarter Evil, Redwater, Malarial Catarrhal Fever (blue tongue). A fee to cover the cost of serum and virus will be charged.

2. The following charges shall be made and payable for services rendered by the Government Veterinary Surgeons in other cases, viz. :—

|  | £ | s. | d. |
|--|---|----|----|
| (1) For every professional visit within three miles of his office or residence ... ..  | 0 | 5  | 0  |
| (2) For every professional visit beyond such distance ... .. plus an additional charge of 2/6 per hour whilst engaged in such visits or £2/2/0 a day of 24 hours ; | 0 | 10 | 6  |
| (3) For advice given at the Veterinary Surgeon's office, for each animal, per visit  | 0 | 2  | 6  |
| (4) The following to be charged in addition to visiting fees :—  |   |    |    |
| a. For every examination as to soundness, each ... ..  | 1 | 1  | 0  |
| b. For castration, horses, each ... ..   | 1 | 1  | 0  |
| c. For castration, bulls, each ....  | 0 | 5  | 0  |
| d. For castration, donkeys, each.. ...   | 0 | 10 | 6  |
| e. For parturition cases, mares, each  | 2 | 2  | 0  |
| f. For parturition cases, cows, each..   | 1 | 1  | 0  |
| g. For other operations, according to nature, from 5/- to £2/2/0.  |   |    |    |

3. Double the above fees will be payable for services rendered on Sundays, public holidays, and between the hours of 7 p.m. and 7 a.m.

4. Applicants for the services of Government Veterinary Surgeons must at their own cost provide the necessary transport for the conveyance of these officers from, and back to, their residence or nearest railway station.

5. Farmers and owners of stock throughout the country frequently telegraph for a Government Veterinary Surgeon to



be sent to attend an animal which has been taken seriously ill. It is rarely possible to comply with these requests at once, as the Veterinary Surgeon may be engaged on duty which he cannot leave, or is at such a distance from where his services are required that he can hardly be expected to arrive in time to be of any service in an urgent case. Hence much valuable time is wasted, the owner of the animal is dissatisfied, and the veterinary staff discredited. To obviate this, in all cases where veterinary advice and assistance are required, the owner should telegraph to "Veteran," Salisbury, with prepaid reply, the nature of the complaint that the animal is suffering from, giving as full and accurate a description of the symptoms as possible. This will enable the Chief Veterinary Surgeon to telegraph advice at once and state whether he is able to arrange for veterinary attendance on the case or not, and save valuable time, which is always of importance in acute cases.

6. The services of Government Veterinary Surgeons will only be available for private work with the consent of such officers, and when such work does not interfere with their official duties, or when the services of a private practitioner are not available.

7. As the arrangement of allowing Government Veterinary Surgeons to attend to private cases is intended purely for the benefit of farmers and stock-owners who may wish to obtain professional advice, no responsibility whatever will be accepted for any loss of stock, etc., which may result from the negligent treatment or advice, or wilful default, of any Government Veterinary Surgeon.

8. All fees collected in terms of these Regulations are payable to the Treasury through the local Receiver of Revenue.

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### Sale of Dip

With a view to enabling farmers to obtain dipping material at as low a rate as possible arrangements have been made whereby orders may be placed with any officer of the Veterinary Department for the purchase of supplies of Messrs. W. Cooper & Nephew's cattle dipping fluid, adapted for three-day, five-day or less frequent dipping. The price of the dip is 48s. 6d. per 10 gals., in not less quantities than that amount, delivered at any siding or station desired, in 5 gal. drums. Applications must be accompanied by remittances, without which



they cannot receive attention. Remittances by cheque should be made in favour of Messrs. Meikle Bros., agents for the dipping fluid, commission being added, where necessary, to cover exchange. Coin or stamps will not be accepted. This dip is in use at all Government dipping tanks.

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### Irrigation

From the Agricultural Engineer assistance may be obtained by farmers for the following :—

1. In the locating of possible irrigation projects.
2. In the preparation of surveys or plans and for irrigation works, including weirs, dams, furrows, pumping plants, and determining the extent of land which may be brought under irrigation schemes, together with rough estimates of costs.
3. In the supervision of construction and carrying out of projects.
4. In the selection of suitable sites for boring operations.
5. Preparing specifications, etc., regarding pumping plants, windmills, and agricultural machinery.
6. Giving general advice on cognate subjects.

Informal advice of a general character will be given to applicants making enquiry by letter or in person. Any applicant desiring professional assistance likely to occupy more than one day should apply for advice in writing. All applicants should specify clearly the nature of the project on which they seek advice, and should give full particulars as to the distance and direction of their farms from some well-known centre. Applicants will be required to provide suitable means of transport for the officer concerned during the period devoted to work on the spot; to provide any unskilled labour that may be required; and to provide for any other contingent services. Applications should be addressed to the Director of Agriculture, who will endeavour to arrange visits as far as possible in order of application, but with due regard to situation, in order to obviate unnecessary travelling and delay. The services of the Agricultural Engineer are given free, but in cases demanding prolonged individual attention, or repeated supervision, a charge may be made according to circumstances.

## Samples

In connection with enquiries, especially with regard to diseases amongst crops, insect pests, soils, grain and the identification of plants, specimens should, wherever possible, be sent, together with full details. It is found that such parcels are often forwarded without any indication of where they are from or why they were sent and it is difficult in such cases to trace the sender. It is, therefore, requested that persons when forwarding samples for examination, indicate clearly their names and address on the package, so as to enable their requirements to be attended to without delay.

## Charges for Dipping Cattle at Government Dipping Tanks.

A charge of 1d. per head is made in respect of all cattle dipped at Government dipping tanks.

Unweaned calves will be dipped free of charge.

Payment may be made in cash or by means of books of coupons at £1, 10/- and 2/6, which can be obtained from Civil Commissioners, Native Commissioners, or through all Veterinary Surgeons and Cattle Inspectors.

The tanks to which these provisions at present apply are the following :—

Salisbury (3), Bulawayo (3), Inyati, Umtali, Penhalonga, Melsetter, Marandellas, Macheke, Mazoe, Lomagundi, Hartley, Gwelo, Selukwe, Enkeldoorn, Victoria, Gwanda, Gatooma, Que Que, Umvuma, Kimberley Reefs.

## Lectures for Farmers

The services of certain of the officers of the Department of Agriculture and the Veterinary Department are available for purposes of delivering lectures on subjects upon which they have special knowledge. As far as practicable, lectures will be accompanied by demonstrations at the time or subsequently in the field. Owing to the many calls on the time of the staff and the exigencies of their duties, alternative dates are desirable in order to avoid disappointment. The following topics are offered as examples of subjects that may be dealt with in this manner, but the suggestion of other themes is invited.

*Agriculture.*—Maize growing: Maize selection and maintenance of the breeding plot: Points of maize and maize judg-



ing, with demonstrations; Utilisation of granite vlei soils; Ground nut culture; Rotation crops for home use and for sale; Veld improvement by winter grasses; Production of foodstuffs for the mines; Ensilage; Fungoid diseases of maize and wheat; Wheat, oats and lucerne under irrigation; The prospects of cotton culture in Southern Rhodesia.

*Veterinary Hygiene.*—Detection and prevention of disease; The care of live stock.

*Live Stock.*—Judging of cattle according to breeds, and for beef, milk and draught; feeding and kraaling of live stock; general principles of cattle breeding; management of imported stock; grading up of native or local stock with pure bred bulls.

*Dairying.*—Home butter-making; building and equipment of a farm dairy; handling and marketing of milk; packing and marketing of butter; construction of cow houses.

*Swine Husbandry.*—Breeding and feeding of swine; some suggestions for the production of first-class bacon pigs; construction of piggeries at moderate cost.

*Chemistry.*—The principles of soil fertility; the principles of manuring; the value of lime in agriculture; chemistry of milk and its products (accompanied by demonstrations in milk-testing).

*Entomology.*—Economic entomology on the farm; the role of insects and their allies in the transmission of disease; scale insects and fruit trees and methods for their control; insect pests and maize; enemies of the potato, insect and fungus; the value and objects of plant import and nursery regulations.

*Irrigation.*—Methods of applying water to land for irrigation; the measurement of water in connection with irrigation; canal irrigation; storage reservoirs; hints on the selection of sites and on the design of earthen and other dams; irrigation by pumping, with notes on the selection of plants.

Enquiries and invitations should in the first instance be addressed to the Director of Agriculture, Salisbury.

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#### CITRUS CULTIVATION.

THE services of Mr. C. E. Farmer, Adviser on Citrus Cultivation to the British South Africa Company, are available. The British South Africa Company will be pleased to receive applications from farmers desirous of obtaining advice from Mr. C. E. Farmer on citrus cultivation, and to place his services at the disposal of the farming community, in so far as his duties permit. Applications, which will be dealt with in order of date, should be addressed to the Director of Land Settlement, Salisbury. No fee will be charged for Mr. Farmer's services.



## Departmental Bulletins

The following Bulletins, consisting of reprints of articles which have appeared in this Journal, are available for distribution free of charge to applicants in Rhodesia :—

### AGRICULTURE.

- No. 2. The Possibilities of Rhodesia as a Citrus Growing Country, by R. McIlwaine, M.A., LL.B.
  - No. 61. Requirements in sending Botanical Specimens to the Department for Identification.
  - No. 62. Services of Agricultural Engineer.
  - No. 64. Hints on Irrigation—Small Gravitation Schemes, by W. M. Watt.
  - No. 81. Possibilities of Export Trade in Oil Seeds, by H. Godfrey Mundy, F.L.S.
  - No. 90. Reports on Experiments—Experimental Station, Salisbury, 1910-1911, by J. H. Hampton.
  - No. 94. Second Report on Experiments, by J. H. Hampton.
  - No. 125. Subterranean Water, by W. M. Watt.
  - No. 137. Drainage for Irrigated and Swampy Land, by W. M. Watt.
  - No. 143. Hints on Planting an Orange or Lemon Grove, by Chas. E. Farmer, Citrus Adviser to the British South Africa Company.
  - No. 153. Citrus Fruit Trees—From Seed to Grove.
  - No. 155. The Manuring of Maize on the Government Experimental Farm, Gwebi, 1912-13.
  - No. 156. Elephant Grass or Napier's Fodder, by J. A. T. Walters, B.A.
  - No. 160. Hints on Irrigation—Pumping Plants, by W. M. Watt, Agricultural Engineer.
  - No. 164. Citrus Fruits in Rhodesia—Suggestions as to where to Plant, by C. E. Farmer.
  - No. 166. Rhodesian Citrus Fruits—Exportation to London.
  - No. 173. Citrus Fruits: Cultivation and Pruning, by C. E. Farmer.
  - No. 177. Notes on the Raising of Seedling Trees, by F. B. Willoughby.
  - No. —. Orange and Lemon Growing in Southern Rhodesia, by R. McIlwaine.
- Tree Culture in Southern Rhodesia, by P. B. S. Wrey, A.M.I.C.E.

### CROPS.

- No. 88. Chicory Growing, by H. Godfrey Mundy, F.L.S.
- No. 106. Cultivation and Preparation of Ginger.
- No. 107. The Cowpea, by R. H. B. Dickson.
- No. 126. Turkish Tobacco.
- No. 128. Paspalum, by J. A. T. Walters, B.A., Assistant Agriculturist and Botanist.
- No. 132. Sumatra Tobacco, Hints to Rhodesian Growers, by C. J. Sketchley.
- No. 133. Tobacco Culture (Virginia)—Planting, Cultivation, Fertilising, Priming, Topping, Suckering, Ripening.

- No. 138. Tobacco Culture (Virginia)—Harvesting and Curing.
- No. 162. Rhodesian Maize: The Principal Types and their Points, by J. A. T. Walters, B.A., Assistant Agriculturist.
- No. 170. Production of Pedigree Seed—Maize, by H. Godfrey Mundy, F.L.S.
- No. 174. Notes on Hop Growing, by H. Godfrey Mundy, F.L.S.
- No. 175. Notes on Lucerne, by H. Godfrey Mundy, F.L.S.
- No. 176. The Cultivation of Castor Oil Beans, by H. Godfrey Mundy, F.L.S.

## ENTOMOLOGY AND VEGETABLE PATHOLOGY.

- No. 58. Onion Thrips, by R. W. Jack, F.E.S.
- No. 66. Selection of Spraying Outfit, by R. W. Jack, F.E.S.
- No. 69. Resin Wash and Means of Applying It, by R. W. Jack, F.E.S.
- No. 75. Fumigation of Fruit Trees with Hydrocyanic Acid Gas, by R. W. Jack, F.E.S.
- No. 100. Tsetse—Preliminary Notes on the Habits of—by R. W. Jack, F.E.S.
- No. 140. Insect Pests of Tobacco in Southern Rhodesia, by R. W. Jack, F.E.S.
- No. 142. The Bean Stem Maggot, by R. W. Jack, F.E.S.
- No. 147. Root Gallworm, by R. W. Jack, F.E.S.
- No. 148. Darkling Beetle Grubs Injurious to Tobacco, by R. W. Jack, F.E.S.
- No. 151. Potato Spraying Experiments for the Control of Early Blight, by Rupert W. Jack, F.E.S.
- No. 154. Borers in Native Timber—Results of Experiments with Preservatives, by Rupert W. Jack, F.E.S.
- No. 158. Two Ladybirds Injurious to Potato Plants, by R. W. Jack, F.E.S.
- No. 171. The Cabbage Web-Worm—A Pest of Cabbage and Allied Plants, by R. W. Jack, F.E.S.
- No. 172. Diseases of the Potato Tuber and the Selection of Sound Seed, by R. W. Jack, F.E.S.

## VETERINARY.

- No. 50. Epizootic Abortion in Cattle, by Ll. E. W. Bevan, M.R.C.V.S.
- No. 51. Strangles, by F. D. Ferguson, M.R.C.V.S.
- No. 53. Animals Diseases Consolidation Ordinance, 1904.
- No. 74. The Detection and Prevention of the Diseases of Stock in Rhodesia, by Ll. E. W. Bevan, M.R.C.V.S.
- No. 77. Animals Diseases Amending Ordinance, 1911.
- No. 80. Detection and Prevention of Diseases of Stock, by Ll. E. W. Bevan, M.R.C.V.S.
- No. 84. African Coast Fever—Diagnosis of Gland Puncture, by Ll. E. W. Bevan, M.R.C.V.S.
- No. 95. Oestrus-ovis in Sheep, by Alec King.
- No. 103. Dipping and Tick-Destroying Agents, by Lt.-Col. H. Watkins-Pitchford.
- No. 121. Rabies, by Ll. E. W. Bevan, M.R.C.V.S., and T. G. Millington, M.R.C.V.S., D.V.H.

Conditions under which Government Veterinary Surgeons' Services are available to the public.

## LIVE STOCK.

- No. 96. Swine Breeds and Breeding of, by Loudon M. Douglas, F.R.S.E.
- No. 105. Bacon Curing on the Farm, by Loudon M. Douglas, F.R.S.E.
- No. 123. Feeding and Care of Imported Bulls, by R. C. Simmons.
- No. 145. Prospects for Importation of Cattle from Australia, by Eric A. Nobbs, Ph.D., B.Sc.
- No. 161. Notes on Cattle Breeding, Part III., by R. C. Simmons.
- No. 163. Feeding and Care of Imported Cattle, by R. C. Simmons.
- No. 167. The Construction of Dipping Tanks for Cattle.
- No. 169. The Breeding and Feeding of Pigs for Bacon Factory Purposes, by R. C. Simmons.

## MISCELLANEOUS.

- No. 93. Formation of Agricultural Credit Associations in Rhodesia, by Loudon M. Douglas, F.R.S.E.
- No. 108. Lime Deposits in Rhodesia and their Value, by G. N. Blackshaw, B.Sc., F.C.S.
- No. 119. Some Notes on Charcoal Burning, by Eric A. Nobbs, Ph.D., B.Sc.
- No. 127. Notes on the Building of Farm Homesteads, by R. C. Simmons.
- No. 129. How to Make Use of the "Fencing Ordinance, 1904," by N. H. Chataway.
- No. 134. Plans and Specifications for Flue Curing Tobacco Barns.
- No. 141. Dry Season and Droughts in Rhodesia, by Rev. E. Goetz, S.J.
- No. 144. Rhodesian Tobacco—Prospects of an Australian Market, by Eric A. Nobbs, Ph.D., B.Sc.
- No. 150. Dry Season and Droughts in Rhodesia, by the Rev. E. Goetz, S.J.
- No. 152. A School of Agriculture for Southern Rhodesia, by Eric A. Nobbs, Ph.D., B.Sc., Director of Agriculture.
- No. 157. Hints on Brickmaking, by G. T. Dyke.
- No. 159. Gwelo Creamery : Hints and Suggestions to Farmers, by W. G. Elliott.
- No. 168. Report on the Methods of Growing, Curing and Selling Bright Tobacco in Virginia, U.S.A., by H. Kay Scorrer.
- Health and Clothing.
- Malaria : its History, Prevention and Cure, by A. M. Fleming, C.M.G., M.B., F.R.C.S. (Ed.), D.P.H. (Camb.), Medical Director.
- Game Law : Summary of.
- Terms for Analysis by the Department of Agriculture, of Produce, Soils, Water, etc.

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**HANDBOOK OF TOBACCO CULTURE** for  
Planters in Southern Rhodesia. Sold by the Department of Agriculture. 2/6.



## Employment on Farms.

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The Department of Agriculture receives numerous enquiries from persons of varied attainments, age and financial position for openings on farms, as managers, assistants and learners, requiring remuneration on corresponding scales, or willing to give services in return for keep.

In order that work may be found for the above and needs of farmers met, applications are invited from both employers and persons seeking employment. Applications are also invited from artisans, such as masons, bricklayers, carpenters, fencers, well sinkers, concrete workers, and the like who may desire work on farms. In cases where employers have obtained the labour they require, or applicants for employment have found work, it is requested that notification be at once sent to the Department of Agriculture, in order that unnecessary correspondence be avoided.

Replies to the following applications should be addressed to the initials of the advertisers, c/o Director of Agriculture, who will forward the letter to the party referred to.

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### SITUATIONS VACANT.

J. M. G.—Wanted man with small capital to farm on shares maize lands, extensive and good.

H. O. T.—Man to learn tobacco curing. Services in return for board and lodging.

E. C. S.—Man to look after cattle and do small repairs to farm implements and wagons. £5 per month and all found; increased to £6 if found suitable after three months.

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### SITUATIONS WANTED.

P. T.—As farm manager. Twenty years' Natal and Rhodesian experience; cattle, mixed agriculture and tobacco.

A. F.—Hungarian, single, aged 29; carpenter by trade, can also build with stone and brick. Speaks English, German, Dutch and Sindebele fluently, also understands general farming. Requires situation on a large estate, such as care, erection and keeping in repair buildings, etc., or management of mixed farm stock. Will go anywhere Northern or Southern Rhodesia.

K. D. H.—Experience on big ranch with native and thoroughbred cattle and sheep; also tobacco and general farming. Understands horses well. Position wanted with fair salary.

H. E. X.—By young man on cattle farm as learner; three months for board and lodging, afterwards salary by agreement.

H. C. T.—General farming, as manager or assistant, brought up on farm. Two years' training Elsenberg Agricultural College. Knowledge of native language. First-class references.

H. B.—Energetic man, married; general farm work, agriculture, dairying and poultry; capable steam tractor driver and fitter; also pump work and well-sinking.

F. G. H.—Requires situation during tobacco curing on farm. Thoroughly understands oxen and general farming. £8 10s. and board to start.

Roderick S. Marshall, Barrow-on-Humber, Hull, England.—Scotch, 20 years of age. Has had experience in dairying (Ayrshires), also in beef-raising, sheep, pigs, horses and general agriculture. Would work for board and lodging the first year.

A. B. B.—As farm manager. Experience in general farming in Natal and Rhodesia. Salary or salary and shares.

G. H. B.—Assistant on general farm. Board and lodging and small salary.

I. C. C.—Assistant on general farm. Seven years' farming experience in Ireland.

W. C. C.—Understands tobacco growing and general farming.

H. E. E.—Assistant on general farm; twelve months' experience in New Mexico.

D. M. K.—Assistant on ranch or mixed farm. £10 per month with board and lodging.

A. E. M. K.—Farm assistant; general or ranch. Experience in farming in Scotland and Cape Province. £5 per month and board.

E. N. P. wishes to gain experience on general farm.

M. J. P.—Good general experience in dairying and general farming. Salary and share of profits.

C. R. I.—Assistant on mixed farm; experienced in tobacco growing and curing.

G. S. M.—Manager of tobacco farm; four years' experience of growing and curing. Share or salary and share.

J. S.—Several years' experience in ostriches, cattle and general farming. Small commencing salary.

H. A. W.—As farm pupil.

B. N. W.—As manager of stock, fruit farm and general agriculture; eleven years' experience in Cape Province and four years in Rhodesia.

H. A. H. C.—Complete course at Elsenburg; two years' experience as manager of mixed farm in Rhodesia. Speaks native language, Dutch and French.

E. L. S.—Farm pupil on tobacco farm.

## Government Notices.

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No. 50 of 1912.]

[8th February, 1912.]

### AFRICAN COAST FEVER.

*Regulations regarding the movement of cattle and the prevention and suppression of disease.*

1. UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw Government Notices Nos. 329 of 1910 and 308 of 1911 and make the following provisions in lieu thereof :—

2. The various districts of Southern Rhodesia are hereby declared an area infected with African Coast Fever for the purposes of section 5 (2) of the aforesaid Ordinance, and, save as hereinafter set out, all movement of cattle within the said districts is prohibited until further notice.

#### *General Movement.*

3. For the purpose of section 22 (1) of the said Ordinance, the following shall be regarded as places within the boundaries of which the movement of cattle may be allowed without special permission :—

- (a) Single farm.
- (b) Two or more adjoining farms, farmed together under one management and situated within one cattle transport area.
- (c) An area, the property of one owner, enclosed by a substantial fence.
- (d) For grazing purposes, an area within a radius of four miles of native kraals situated on unalienated land or in reserves, save and in so far as such area includes any private land.

The sites of such kraals shall be deemed to be the places where they are situated at the date of promulgation of these regulations.

4. Notwithstanding the provisions of the last preceding section, or of section 9 hereof, the Chief Inspector may, on the outbreak of disease, or for such other cause as may be deemed expedient, direct the isolation or quarantine of cattle on a limited area of the aforesaid places.

5. The movement of cattle from place to place may be permitted under the special permission, in writing, of an Inspector, Sub-Inspector, or other officer or person duly authorised by the Administrator to grant such permission.

6. No permission as aforesaid shall permit the movement of cattle—

- (a) Without the written consent of the owners, occupiers or managers of occupied land, and in the case of native reserves, of the Native Commissioner of the district over which land or reserve such cattle will pass, whether along roads or otherwise; provided, however, that refusal to grant such consent shall be in writing, and provided further that if the Controller of Stock or the Chief Inspector shall consider that such consent is withheld without good and sufficient cause he may permit of movement without such consent.



If any such person mentioned above refuse to give consent or to state a reason for refusing to do so in writing, no valid objection shall be deemed to exist and movement may be permitted without such written consent.

- (b) Within a veterinary district as defined in the Schedule annexed hereto from one transport area to or through another without the consent of the Cattle Inspector in charge of such area.
- (c) From any veterinary district to or through another without the consent of the District Veterinary Surgeon of such district.

#### *Slaughter Cattle.*

7. Cattle moved to any centre for slaughter under the provisions of these or any other regulations shall, on arrival, be immediately taken to such quarantine area (if any) as is provided for the purpose and immediately branded with the letters "V.D." on the near hip.

8. Cattle admitted to a quarantine area in terms of the last preceding section shall be slaughtered within twenty-one days of the date of admission, and shall not be permitted to leave the same except for the purpose of being slaughtered at the appointed abattoir, and if found outside such area, except for the said purpose, may be destroyed on the order of the Chief Inspector or Controller of Stock; provided, however, that the Chief Inspector may allow the removal of cattle from such an area under such conditions as he may prescribe.

#### *Transport Cattle.*

9. The use of cattle for draught purposes is prohibited except :—

- (1) Within the boundaries of the places defined in section 3 (a), (b) and (c) hereof.
- (2) Within the boundaries of areas already fixed for the use of cattle for draught purposes in terms of regulations published under Government Notice No. 329 of 1910, or such other areas as may be fixed by the Administrator.

10. Notwithstanding the provisions of section 9, no permit shall authorise the working of cattle

- (a) which are not clearly and distinctly branded with the registered brand of the owner;
- (b) in any wagon or vehicle which shall not have the owner's name and address legibly and permanently inscribed on the right side thereof.

11. No wagon or other vehicle drawn by oxen shall be moved from one cattle transport area into another without the permission of the Cattle Inspectors concerned, and under such conditions as they may impose.

#### *General Provisions.*

12. On the outbreak or suspected outbreak of disease, the Administrator may declare an area of infection around and embracing the place of outbreak or suspected outbreak, and a further area or areas around such area of infection as a guard area, whereupon all movement of cattle into and from place to place within such area or areas shall be immediately suspended, except as hereinafter provided.

A.—*In areas of infection and guard areas:—*

- (1) Cattle in transit by rail may be moved through such area.
- (2) Cattle from beyond the borders of Southern Rhodesia may be detained within such area or areas *en route* to destination.
- (3) Cattle for *bona fide* farming, dairy and slaughter purposes may be moved into such area or areas by permission of the Chief Inspector and under such conditions as he may impose.

*B.—In guard areas only:—*

Cattle may be moved into and from place to place within such area under the conditions of section 6 hereof.

13. The removal of green forage, hay, fodder, bedding reeds, manure or of such other articles as may be reasonably supposed capable of conveying infection, shall be prohibited from areas of infection, save and except with the special permission of the Administrator.

14. Whenever an area shall have been declared under section 12 hereof, every person within such area, or within such further area as may be specified by Government Notice, owning or in charge of cattle shall, upon the death or slaughter because of disease, suspected disease, or accident, of any such cattle, immediately report such occurrence through the nearest Cattle Inspector, Native Commissioner or Police Officer to the District Veterinary Surgeon.

15. Notwithstanding the provisions of these regulations, it shall be competent for the Chief Inspector of Cattle to authorise and direct the movement of cattle for the purposes of isolating, dipping, quarantine, or any other such objects as may be deemed necessary to prevent or suppress an outbreak of disease.

16. Whenever an area shall have been declared an area of infection or guard area in terms of section 12 hereof, any person who shall allow any cattle to stray or be otherwise removed, except as provided for in these regulations, from any one place within such area to another place, or from a place outside of to a place within such area, shall be guilty of an offence against these regulations.

17. All cattle within the limits of the various commonages and townlands, areas of infection and guard areas as declared under section 12 hereof, or depastured on common grazing ground, shall be dipped or sprayed at least once in every three days, unless the Chief Inspector shall authorise the extension of the time between such dipping or spraying, or the entire suspension of the same.

18. In all areas of infection and guard areas sheep and goats shall be dipped at such periods as may be directed by the Chief Inspector.

19. Whenever the owner, occupier, or manager of a farm shall adopt means of cleansing cattle running thereon, either by spraying, dipping, or by any other method, the Chief Inspector may order any natives or other persons having cattle on the same farm to cleanse such cattle, and the Native Commissioner of the district within which the farm is situated may enter into an arrangement with the native owners of cattle to cleanse such cattle at a charge to be mutually agreed upon between the said owner, occupier or manager and the said native owners.

20. All permits for the removal of cattle issued under the provisions of the said Ordinance or of any regulations framed thereunder shall specify legibly and clearly on the face thereof the place from and to which such cattle may be removed, the route by which they shall travel, the number and brands of such cattle, the time allowed for the journey, and such other particulars and conditions as it may be deemed expedient to provide.

21. No permit issued for the movement of cattle shall be taken to authorise any trespass in connection with such movement.

22. Notwithstanding the provisions of these regulations, it shall not be lawful for any owner of cattle to allow any such cattle to be on any road, public outspan, commonage, or any property other than that of the owner, unless they are free from ticks or unless they have been effectively cleansed by dipping, spraying or other process, within fourteen days of being allowed on such road or other place. Any beast having ten or more ticks on it shall not be considered free from ticks.



23. Any person contravening the provisions of these regulations or the conditions set out in permits issued thereunder, shall, where no higher penalty has been by the said Ordinance or any other law provided, be liable in respect of each offence to a fine not exceeding £20, or in default of payment to imprisonment with or without hard labour for a period not exceeding three months.

### SCHEDULE "A."

#### VETERINARY DISTRICTS OF SOUTHERN RHODESIA.

##### (1) *Salisbury.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912 :—

32. Battlefields; 33. Hartley and Gatooma; 34. Gadzena Station; 35. Makwiro Station; 36. Norton Siding; 37. Hunyani Tank; 38. 1645½ Peg B. & M. & R. Railways; 39. Salisbury A.; 40. Salisbury B.; 41. Salisbury C.; 42. Salisbury D.; 43. Arcturus; 44. Bromley; 45. Marandellas North; 46. Marandellas South; 48. Headlands Station; 49. Junction Mazoe and Lomagundi Railways; 50. 23-Mile Peg, Lomagundi Railway; 51. Passaford Station; 52. 35-Mile Peg, Lomagundi Railway; 53. Gwibi Tank Halt; 54. Banket, Lomagundi; 55. Eldorado, Lomagundi; 56. Selby Siding; 57. Mazoe; and 58. Kimberley Reefs.

##### (2) *Bulawayo.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912 :—

1. Plumtree; 2. Marula Siding; 3. Figtree; 4. Westacre Junction; 5. Bulawayo Area; 6. Heaney Junction; 7. Bembesi Station; 8. Insiza North; 9. Insiza South; 10. Shangani North; 11. Shangani South; 14. Redbank; 15. Nyamandhlovu Station; 16. Malindi Station; 17. Wankies Area; 18. Matetsi Siding; 19. Matopo Terminus; 20. Sabiwa Siding; 21. Gwanda Station; 22. West Nicholson; 23. Belingwe; 59. Essexvale and Balla Balla Areas; 60. Stanmore Siding Area; 61. Filabusi Area.

##### (3) *Gwelo.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912 :—

12. Somabula Siding; 13. Gwelo Station; 24. Selukwe Area; 25. Surprise Area; 26. Indiva Siding; 27. Lalapanzi; 28. Iron Mine Hill Siding; 29. Umvuma Siding; 31. Que Que Station.

##### (4) *Umtali.*

An area comprising the native districts of Umtali, Melsetter, Makoni and Inyanga.

No. 24 of 1914.]

[14th January, 1914.

### AFRICAN COAST FEVER.

(As amended by No. 207 of 1914.)

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Government Notices Nos. 82, 129, 143, 258, 297 and 326 of 1913, and, in terms of section 12 of Government Notice No. 50 of 1912, declare the following areas of infection and guard areas :—



## (1) NATIVE DISTRICT OF MATOBO.

(a) *Area of Infection.*

The farms Collaton and Irene and the Mabogutwani Outspan.

## (2) NATIVE DISTRICT OF SALISBURY.

(a) *Areas of Infection.*

- (1) Hatfield Estate and Hatfield Plots.
- (2) Salisbury Commonage.
- (3) M.T.C., Gallagher's Lease and Makabusi farms.
- (4) Epworth, Adelaide and Glenwood farms.

(b) *Guard Areas.*

- (1) The farms Haydon and Good Hope.
- (2) The farms Warren, Lochinvar, the eastern sub-division of Willowvale, Makabusi Outspan, Ardbennie Township, Waterfall, Hopley, Saturday Retreat, Odar Outspan, Stoneridge, Spreckley, Eyrecourt, Eyerston, Retreat, Prospect, Bunker's Hill, Adair, Boutelle, Godavery, Twentydales, Deanesbrook, Nalire Native Reserve, Galway Estate, Mayfair, Sebastopol, Dispute, Caledonia, Donnybrook, Greengrove, Ventersburg, Lorelei, Letombo Reserve and Greendale.

## (3) NATIVE DISTRICT OF UMTALI.

(a) *Areas of Infection.*

- (1) The farms Inodzi, Nyagari, Mountain Home (The B.), Umtali Mission and the Penhalonga Valley.

- (2) The farm Mabonda.

(b) *Guard Area.*

That portion of the native district of Umtali bounded on the south by a line running from the Odzi River along the south-western boundaries of the farms Odzi Junction, Grange, and Premier Estate, the western and southern boundaries of Wiermouth and the southern boundaries of Devonshire and Umtali Commonage.

## AFRICAN COAST FEVER.

Government Notice No. 76 of 26th February, 1914, published in *Government Gazette* dated 27th February, 1914, amends the following areas in which the use of cattle for draught purposes may be permitted under the conditions of the regulations governing the movement of cattle:—

Plumtree, Marula Siding, Figtree, Westacre Junction, Bulawayo area, Heany Junction, Bembesi Station, Insiza North, Insiza South, Shangani North, Shangani South, Belingwe area, Redbank, Nyamandhlovu Station, Gwaai Station, Malindi, Wankie, Matetsi, Matopo Terminus, Essexvale, Balla Balla and Filabusi, Stanmore Siding, Gwanda, West Nicholson, Gwelo, Selukwe, Umvuma, Iron Mine Hill, Lalapanzi, Hunter's Road, Que Que, Hartley, Gatooma and Battlefields, Gadzema Station, Makwiro, Norton Siding, Gwebi Tank Halt, Lomagundi, Mazoe, Bindura.

No. 369 of 1913.]

[11th December, 1913.

## IMPORTATION AND USE OF VIRUS, VACCINE, ETC.

UNDER and by virtue of the powers vested in me by section 5, sub-section (6) (e). of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby provide as follows:—

(1) No person, firm or corporation shall manufacture, import, sell, barter or exchange any virus, vaccine, serum or analogous product used for the diagnosis or treatment of diseases of animals without the permission in writing of the Chief Inspector.

(2) No person shall use any virus, vaccine, serum, blood, bile or analogous product for the diagnosis or treatment of animals without the permission in writing of the Chief Inspector.

(3) Any person desiring to import, manufacture, sell, barter or exchange or to use any of the above-mentioned substances or products shall apply to the Chief Inspector for his requisite permission, which may be refused or granted under such conditions as the Chief Inspector may impose.

(4) Any person contravening any of the above regulations or failing to observe the conditions attached to any permit issued in terms of the last preceding sub-section shall be liable on conviction to a fine not exceeding £20, or in default of payment of any fine inflicted to imprisonment with or without hard labour for a period not exceeding three months.

No. 186 of 1914.]

[23rd April, 1914.]

#### IMPORTATION OF CATTLE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel the regulations published under Government Notice No. 128 of 1914, and make the following provisions in lieu thereof :—

1. The importation of cattle will be permitted from the Cape Province, the Orange Free State and the Transvaal on the following terms and conditions :—

- (1) A permit shall be required from the Chief Inspector, which may contain such conditions as shall from time to time appear expedient.
- (2) The importation of cattle with more than two permanent central incisor teeth shall not be permitted, except that animals entered in the South African Stud Book or the appendix thereto, with not more than the first and second pairs of permanent incisors, may be imported.
- (3) Applications for permission to import shall be in the form "A" attached hereto, and accompanied by a declaration in the annexed form "B."
- (4) All importations shall be by rail, and for the purposes of importation, Bulawayo shall be the port of entry.
- (5) All cattle imported in terms of these regulations shall, on arrival at Bulawayo, Salisbury or Umtali, be submitted to such examination or tests as the Chief Inspector may direct. If such examination or tests disclose the existence of any destructive disease, the cattle shall be immediately destroyed and the carcasses thereof disposed of in such a manner as a Government Veterinary Surgeon may authorise or require. The Chief Inspector may permit of the age restriction and the tests aforesaid being dispensed with in the case of cattle in transit by rail to any place beyond the borders of Southern Rhodesia.

- (6) All expenses or losses incident to quarantine, examination, testing or destruction as aforesaid shall be borne by the owner of the cattle.

2. The importation of cattle from the United Kingdom of Great Britain and Ireland, the United States of America, the Kingdom of the Netherlands and Germany will be permitted under the following terms and conditions :—

- (1) Importation shall be through and direct from the ports of Cape Town or Port Elizabeth, and there shall be a consignment note or other satisfactory evidence that cattle so imported have come direct from one of the above-mentioned countries.
- (2) The provisions of sub-sections (1), (5) and (6) of section 1 hereof shall apply to importations in terms of this section.

3. Any person introducing cattle in contravention of these Regulations, or failing to comply with any of the conditions attached to permits to import, or furnishing applications, declarations, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, testing, destruction or disposal of carcasses, shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties shall have been provided for such offences by the "Animals Diseases Consolidation Ordinance, 1904"; provided, however, that the penalties imposed by these Regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

#### ANNEXURE "A."

##### APPLICATION FOR CATTLE IMPORTATION PERMIT.

1. Applicant's Name and Address.....
2. Number and Class of Cattle to be imported.....
3. Area or Farm and District where Cattle are at present located.....
4. Area or Farm and District to which Cattle are to be moved.....

Applicant's Signature.....

Date.....

Application.....

Permit No.....

#### ANNEXURE "B."

I, ..... residing on the farm ..... in the district of ..... do solemnly and sincerely declare that the ..... (number in writing) animals also enumerated below have been in my possession since birth, and that Lung sickness (Contagious Pleuro-Pneumonia) has not existed amongst any of my cattle, nor on my farm, during the last four years, and that these animals have never been exposed for sale in any public market or stock fair.



[2nd June, 1910.

## IMPORTATION OF CATTLE FROM NORTH-EASTERN RHODESIA.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that the importation of cattle from North-Eastern Rhodesia may be permitted under the following terms and conditions:—

1. The permission of the Chief Inspector of Cattle be first had and obtained.
2. All cattle shall be introduced by way of the town or port of Feira, which is hereby declared a port of entry.
3. All applications for permission to import shall be accompanied by—
  - (1) A certificate by a Government Veterinary Surgeon of the territory of origin that—
    - a. the districts from which they come and through which they pass are free from contagious diseases of animals;
    - b. the animals in respect of which the application is being made have been examined and are free from any destructive disease.
4. All cattle shall on entry be taken to a quarantine area defined by the Chief Inspector of Cattle, and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, not less than three months.
5. Cattle at Feira at the date of promulgation of this notice may be removed to the quarantine area on permission of the Chief Inspector of Cattle without the certificates detailed above.
6. Any person found introducing cattle in contravention of these regulations, or failing to comply with any of the conditions attached to permits to import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties have been provided for such offence by the "Animals Diseases Consolidation Ordinance, 1904"; provided, however, that the penalties imposed by these regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

## SCHEDULE "A."

## 1. CERTIFICATE UNDER SECTION 3. (1), a.—

I hereby certify that I have examined the following cattle belonging to  
Mr. ....

..... Cows and heifers,  
..... Calves,  
..... Oxen and bulls,

and that the districts from which they come and through which they will pass in this territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signature .....  
Government Veterinary Surgeon.

## 2. CERTIFICATE UNDER SECTION 3. (1), b.—

I hereby certify that I have examined the following cattle belonging to  
Mr. ....

..... Cows and heifers,  
..... Calves,  
..... Oxen and bulls,

In my opinion these animals are free from all destructive diseases.

Signature .....  
Government Veterinary Surgeon.

No. 211 of 1910.]

[4th August, 1910.]

## IMPORTATION OF CATTLE FROM NORTH-WESTERN RHODESIA.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that, notwithstanding the prohibition contained in Government Notice No. 89 of 1908, the importation of cattle from North-Western Rhodesia may be permitted under the following terms and conditions:—

1. The permission of the Chief Inspector of Cattle shall be first had and obtained.

2. All cattle shall be introduced (a) by rail via the Victoria Falls, or (b) by way of the town or port of Feira, which are hereby declared to be ports of entry.

3. All applications for permission to import shall be accompanied by a certificate by a Government Veterinary Surgeon of North-Western Rhodesia that—

- (a) the districts from which they come and through which they pass are free from contagious diseases of animals;
- (b) the animals in respect of which the application is being made have been examined and are free from contagious diseases of animals.

4. All cattle shall on entry be taken, where possible by rail, to such quarantine area and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, but not less than three months.

5. Any person found introducing cattle in contravention of these regulations, or failing to comply with any of the conditions attached to permits to import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all



lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months; provided, however, that the penalties imposed by these regulations shall not exempt from liability to penalties, forfeiture, or destruction, elsewhere provided for

#### ANNEXURE "A."

##### *Certificates under Section 3.*

(a) I hereby certify that I have examined the following cattle belonging to Mr. ....

.....cows and heifers,  
.....calves,  
.....oxen and bulls,

and that the districts from which they come and through which they will pass in this Territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signed.....

Government Veterinary Surgeon.

(b) I hereby certify that I have examined the following animals belonging to Mr. ....

.....cows and heifers,  
.....calves,  
.....oxen and bulls.

In my opinion these animals are free from all destructive diseases.

Signed.....

Government Veterinary Surgeon.

NOTE.—All numbers are to be expressed in words.

#### IMPORTATION OF STOCK FROM THE PROVINCE OF THE CAPE OF GOOD HOPE.

WITH reference to Departmental Notice of 28th February, 1912, it is hereby notified that the said Notice is cancelled, and importation of stock will now be permitted, in terms of Government Notice No. 110 of 1908, from the Province of the Cape of Good Hope, with the exception of the following districts :—

Komgha  
East London

Peddie  
Victoria East  
Kingwilliamstown  
Stutterheim  
Cathcart

Stockenstrom  
Queenstown (Gwatyu Ward only)  
Glen Grey  
Maclear  
Elliot Slang River  
Wodehouse  
Barkly East

No. 375 of 1912.]

[28th November, 1912.]

#### IMPORTATION OF POULTRY.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," as amended by the "Animals Diseases Amendment Ordinance, 1910," I do hereby declare and make known that the following regulations shall be in force and effect from date of publication hereof :—

(1) All poultry imported by rail shall be inspected by an Inspector or Sub-Inspector at Plumtree, Bulawayo or Umtali.

(2) Should any consignment of poultry shew symptoms of disease, or should such Inspector or Sub-Inspector have reason to believe that any disease exists in, or that infection is likely to be conveyed by such consignment.



he may order the detention and isolation of the whole consignment for such period as he may deem necessary.

(3) The Chief Inspector may order the destruction of all poultry which he has reasonable grounds for believing to be diseased or likely to convey infection.

THE following extract from Live Stock Regulations, printed on page 150 of the South African Railways Official Tariff Book, is published for general guidance :—

Poultry are not accepted by rail unless they are placed in a crate and the following conditions are complied with :—

(1) The size of the crate shall be 3 feet 6 inches by 2 feet 9 inches external floor dimensions; for turkeys and geese the height shall be 30 inches; and for fowls, ducks, and poultry of a like size, the height shall be 20 inches.

(2) Each crate must contain two drinking vessels filled with pure water, such vessels to be not less than five inches in depth, of the unspillable type, one being fixed at opposite corners of the coop.

(3) Each crate shall contain two receptacles for food of a suitable size, filled with suitable food other than whole maize.

(4) The birds must not be over-crowded in the crates, and in no case must there be more than 20 fowls, ducks or other birds of a like size, or ten turkeys or geese.

(5) Different species of birds must not be placed in the same coop.

Unless coops, crates, and the like are strong enough to bear ordinary transit handling, the Administration will not accept responsibility for loss.

No. 336 of 1911.]

[26th October, 1911.

#### RABIES.

THE following instructions regarding the treatment of persons bitten by rabid animals are published for general information.

In every case where a person has been bitten by a dog or other animal known or suspected to be rabid, the following precautions are recommended :—

- (1) The wound should be immediately and thoroughly cauterised. This, if it does not altogether prevent the disease, delays its onset sufficiently for Pasteur treatment to be successfully applied.
- (2) The patient should be sent to Salisbury for treatment at once. Delays are dangerous.
- (3) The fullest information should be sent to the Health Department as to date when bitten, locality, fate of dog, and especially reasons for supposing the dog to be mad.

#### SUMMARY OF THE "GAME LAW CONSOLIDATION ORDINANCE, 1906," AND REGULATIONS ISSUED THEREUNDER.

The Ordinance divides the game into three distinct classes, described as follows :—

- (a) Birds and Small Buck.
- (b) Bushbuck, Hartbeest, Impala, Lechwe, Pookoo, Roan and Sable Antelope, Sitatunga, Tsessebe, Waterbuck, and Wildebeest.
- (c) Royal Game, which includes Eland, Elephant, Giraffe, Gemsbok, Hippopotamus, Inyala, Koodoo, Ostrich, Rhinoceros, Springbuck and Zebra.

The shooting season for Class "A" is as follows :—

In Mashonaland :

Birds from 1st May to 30th September.

Small Buck from 1st May to 31st October.

In Matabeleland :

Birds and Small Buck from 1st May to 31st October.

To shoot in Class "A" a licence costing £1 per annum is required. This entitles holders to hunt in both Provinces during the open season.

Class "B."—The season opens on 1st July and closes on 30th November in both Provinces. The licence fee is £25 for non-residents and £5 for persons having their domicile in Southern Rhodesia. This licence entitles the holder to shoot up to 15 head, which number may be increased to a total of 25 upon payment of a further sum of £15 in the one case and £5 in the other.

Class "C."—The Administrator may, if he is satisfied that the animals are actually required for scientific purposes, grant to the holder of a game licence permission to shoot or capture any of the species included in this Class. Such permit requires a £5 stamp. Applications in writing, together with proof of *bona-fides*, should be addressed to the Director of Agriculture.

Game for Farming Purposes.—Permits may be granted for the capture of Eland, Ostrich, Zebra or other animals for the purposes of breeding or farming. Such permits require a stamp of the value of £1 and remain in force for six months. Application, accompanied by a sworn declaration, should be made through the Director of Agriculture or the Civil Commissioner of the district.

Game Injuring Crops.—The occupier of any cultivated land or any person acting under the authority of such occupier, may at any time destroy game actually doing damage on such land.

Elephants on Occupied Farms, Melsetter.—The destruction of Elephants when found on occupied farms on the High Veld in Melsetter District is authorised (*vide* Government Notice No. 284 of 1908).

Open Areas.—Government Notices Nos. 201, 207 and 321 of 1913 and 98 of 1914 permit the shooting or capturing of all classes of game with the exception of ostriches and other birds classified as game, within the following areas in the Hartley district and the Sebungwe district for a period of one year from 1st July, 1913, and Lomagundi district for one year from 1st November, 1913 :—

Hartley District.—From the railway bridge on the Umfuli River, thence north-westwards along the Umfuli River to where it joins the Umniati River, thence southwards along the Umniati River to where it joins the Umsweswe River, thence eastwards along the Umsweswe River up to the drift at the Lydia Mine, thence along the old road from Lydia Mine to Etna Mine and to Inez Mine, thence northwards along the road from Inez Mine to Hartley, thence in the direction of the railway bridge to the starting point on the Umfuli River.

Sebungwe District.—From the confluence of the Sengwe and Lutope Rivers up the Lutope to its headwaters, thence in a south-east and easterly direction following the southern edge of the escarpment, leaving Meare's farm to the south, to the Mafungabusi Peak, thence northwards along the escarpment to the Njelele River, and down that river to its confluence with the Sanyati River, thence northwards down the Sanyati River to its confluence with the Piriwiri River, thence direct in a north-westerly direction to Picaninyemba, and thence along the footpath to Nenyunka on the Sengwe River, thence southerly up the Sengwe River to its confluence with the Lutope.

Lomagundi District.—An area bounded by a line drawn from the junction of the Angwa and Mkwichi Rivers, in a southerly direction up the Angwa to its junction with the Chumsenga River; thence easterly direct to the junction of the Hunyani and Msitkwe Rivers; thence northerly down



the Hunyani to a point opposite Mokore Hill; thence westerly to the junction of the Angwa and Mkwichi Rivers.

Also an area bounded by a line drawn from the junction of the Chum-senga and Angwa Rivers up the Angwa to the point where the Sinoia-Urungwe Road crosses that river; thence along this road in a south-easterly direction to the Hunyani River; thence down that river to its junction with the Mesitkwe River; thence westerly direct to the point first named.

Ostriches, Charter and Chilimanzi Native Districts.—Notice No. 154 of 1914 permits the shooting or capturing of ostriches within fenced areas in the above districts for a period of six months from 2nd April, 1914.

Elephants, Hartley District.—Notice No. 168 of 1914 permits the shooting or capturing of elephants on or within five miles of the farm Walden, in the Hartley District, for a period of one year from 9th April, 1914.

The game specified may be shot in these open areas without a licence.

Game in Class "A" may be hunted in the close season until further notice on private land in the Melsetter district by holders of a licence.

Protected Areas.—No game may be hunted or killed within the limits of the Commonage or Townlands of Bulawayo and within a radius of two miles of the Court House, Gwelo, or within the Urungwe Game Sanctuary, as defined by Government Notice No. 237 of 1906.

"Locust Birds" are strictly protected, *vide* Government Notice No. 390 of 1912.

Export of Game.—No living Game or the Eggs of any Game Birds may be exported beyond the limits of Southern Rhodesia without a written permit.

Shooting on Private Land.—A licence does not entitle the holder thereof to shoot on private land without the permission of the land-owner.

No. 390 of 1912.]

[19th December, 1912.

#### PROTECTION OF LOCUST BIRDS.

UNDER and by virtue of the powers vested in me by the "Game Law Consolidation Ordinance, 1906," I do hereby declare that the following Locust Birds :—

- (1) Great Locust Bird or White Stork (*Ciconia alba*);
- (2) Lesser Locust Bird or Nordmann's Pratincole (*Glareola melanoptera*);
- (3) Small White Heron or Cattle Egret (*Bubulcus ibis*);
- (4) Wattled Starling (*Dilophus carunculatus*);

are added to class "A" of the said Ordinance, and shall be strictly protected, and not hunted or destroyed, throughout Southern Rhodesia for a period of five years from date hereof.

No. 249 of 1908.]

[27th August, 1908.

#### PROTECTION OF TREES.

IT is hereby notified for public information that any person who shall cut down for use as fuel, or for any other purposes than *bona-fide* farming, mining or manufacturing purposes, or cause to be so cut down the "Wild Westeria" (native name M'Pakwa or M'poea) tree, will be liable to prosecution for contravention of the provisions of the Forest and Herbage Preservation Act, 1859, and upon conviction to a fine not exceeding £100, or to imprisonment with or without hard labour for a term not exceeding six months, or to such fine and imprisonment, or to such imprisonment without a fine.



No. 211 of 1909.]

[16th September, 1909.]

**PRODUCE FROM NATAL AND TRANSVAAL.**

UNDER and by virtue of the power vested in me by section 8 (2) of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby prohibit the introduction from Natal and the Transvaal of the undermentioned produce thereof:—Grass, straw, hay, lucerne hay, forage, green lucerne, sugar cane, or any other bedding or fodder plant.

No. 216 of 1914.]

[21st May, 1914.]

**ESTABLISHMENT OF A POUND ON FARM LISCARD, INSIZA  
NATIVE DISTRICT.**

UNDER and by virtue of the powers vested in me by section 5 of "The Pounds and Trespasses Ordinance, 1903," I do hereby declare and make known that at the request of the Civil Commissioner, Bulawayo, a pound has been established on the farm Liscard, Insiza, in the magisterial district of Bulawayo, and that the said pound shall be available for the public as from the 8th May, 1914.

## Department of Posts and Telegraphs, Southern Rhodesia.

Postal Notice No. 12 of 1913.

**AGRICULTURAL PARCELS POST.**

IT is hereby notified for public information that, on and after the 1st August, 1909, any article produced, and, if manufactured, produced and manufactured within Southern Rhodesia may be transmitted by Agricultural Parcels Post at the reduced rate of threepence per lb. or fraction thereof, up to a limit of eleven lbs. in weight.

The Agricultural Parcels Post is designed to bring the producer into direct communication with the consumer, and is available for the transmission of:—

|                        |             |              |
|------------------------|-------------|--------------|
| Biscuits               | Dried Meats | Plants       |
| Bread                  | Eggs        | Poultry      |
| Butter                 | Flour       | Seeds        |
| Confectionery          | Flowers     | Sugar        |
| Cigarettes             | Honey       | Tobacco      |
| Dried & Bottled Fruits | Jam         | Wool Samples |

and other articles produced within Southern Rhodesia. It does not extend beyond the borders of Southern Rhodesia.

The senders of articles at the reduced tariff applicable to the Agricultural Parcels Post will be required to sign a declaration that the contents are the *bona fide* produce of Southern Rhodesia.

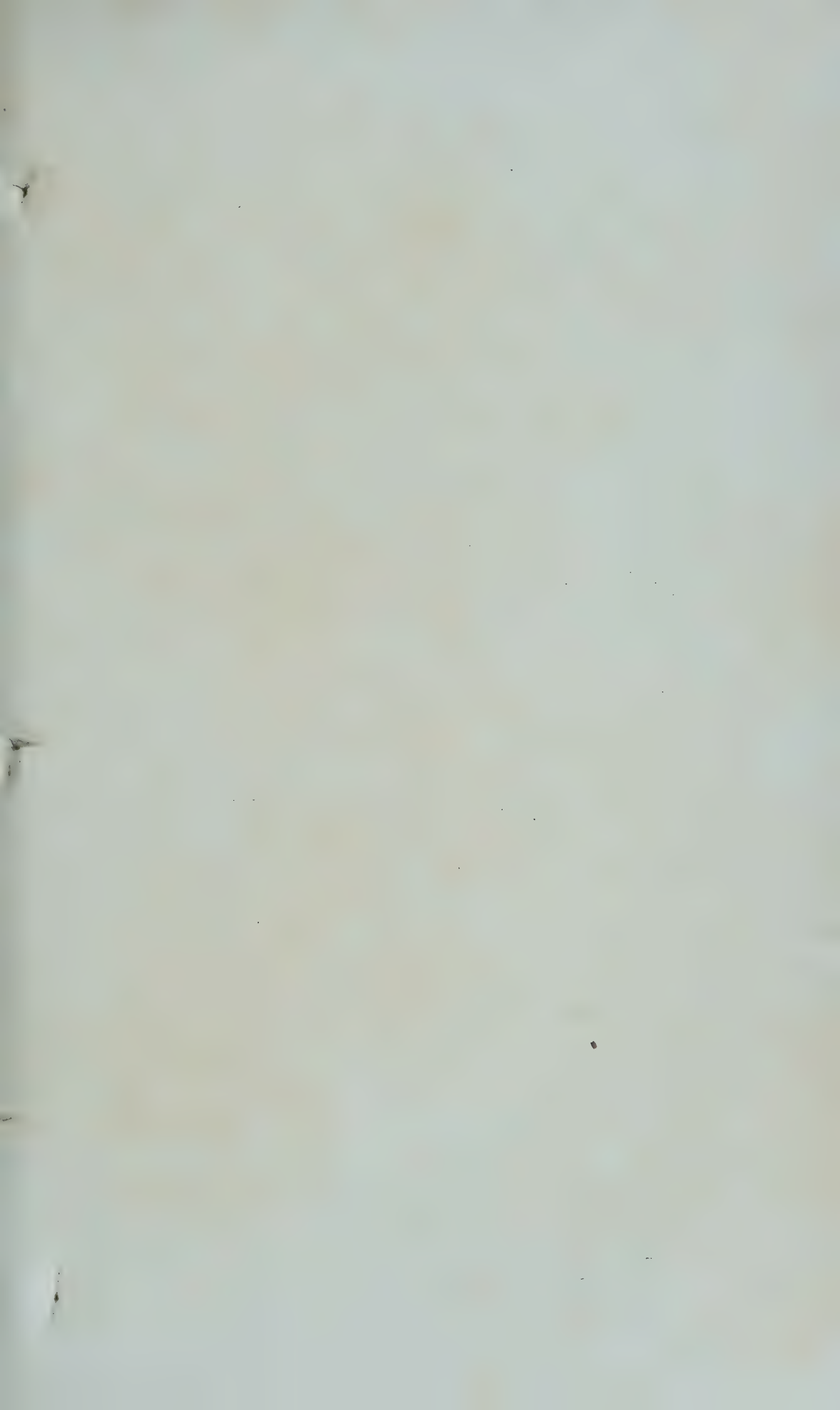
The limits of size and weight, and the general regulations, are those applicable to the Inland Parcels Post.

G. H. EYRE,  
Postmaster General.

General Post Office, Salisbury,  
31st March, 1913.

**SPECIAL RATES FOR FRUIT EXPORTED OVERSEA.**

THE Beira and Mashonaland and Rhodesia Railways announce that, with effect from 1st January, 1914, fruit for export oversea, beyond South Africa, will be conveyed from any station on these Railways (including Broken Hill-Congo Border section) to Beira at a maximum rate of 20s. per ton, and to Union Ports at a maximum rate of 30s. per ton, Station to Station, Owner's Risk.





“Ariel Knight,” four-year-old imported Shorthorn bull, the property of Mr. W. C. Morgan, Redleaf, Morgan’s Spur.—First prize, Bulawayo, and reserve champion.



Judging dairy classes at Bulawayo Show.





# THE RHODESIA Agricultural Journal.

*Edited by the Director of Agriculture,  
assisted by the Staff of the Agricultural Department.*

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## Editorial.

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*Correspondence on subjects affecting the farming industry of Southern Rhodesia is invited. Enquiries will be replied to direct, or through the medium of the JOURNAL. An interchange of ideas and suggestions between farmers will be particularly welcomed. Contributions of a suitable nature for insertion in this JOURNAL will be much appreciated. All communications regarding these matters, and advertisements, should be addressed to the Editor, Department of Agriculture, Salisbury.*

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THE AGRICULTURAL SHOWS.—The show season passed off successfully and has once again demonstrated the wide scope that exists for farming enterprise in Rhodesia. The most instructive feature perhaps has been the successful efforts made by outlying communities to organise local shows, and the value of these can hardly be overestimated in the way of demonstrating the capabilities of different districts, in educating farmers as to what is being done by their neighbours and can be done by themselves, and in opening up commercial relations between producers and buyers. The interest and enthusiasm displayed by the farmers in the shows

at Hartley, Iron Mine Hill and Victoria, and the benefit accruing therefrom to those directly concerned with arable and stock farming, compare favourably with the large shows conducted and attended by townsmen largely, where counter attractions detract much from the primary objects of the show. These district shows, if they preceded instead of following the large ones, would, we think, serve a useful purpose as feeders, for the winning entries could be brought forward at the central shows to compete for championship honours. We deal with each show except Marandellas, which falls too late for mention in this issue.

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**GWELO AGRICULTURAL SHOW.**—The show season opened with the Midlands Agricultural and Horticultural Society's show at Gwelo on 21st, 22nd and 23rd May. Although, in point of numbers, there was a falling off in the cattle section as compared with last year, the quality of the exhibits shewed a marked improvement. The Friesland classes, however, were an unfortunate exception and produced mainly moderate grade animals only. Shorthorns, North Devons, South Devons, Sussex and Africanders were particularly strongly represented, and, besides many good colonial **beasts**, a large number of first-class imported animals were **shewn**. The work of the very competent judges, Messrs. Bradshaw and Dewar, was by no means simple.

The cup for the best bull in the yard for beef purposes was secured by Mr. W. E. T. Bolitho, of Trevelloe Estate, Shangani, with a very fine blocky Shorthorn, "Plutoerat," which had to compete against South Devon, North Devon and Sussex bulls. The best cow for beef purposes was an imported Shorthorn, the property of the B.S.A. Company, from Rhodesdale. Mr. W. T. Summers won the cup for the best dairy cow or heifer with a nice colonial-bred Shorthorn. His bull of the same breeding was placed reserve as the best dairy bull, being beaten by an imported South Devon from the Trevelloe Estate. He was only just beaten after very keen competition by Mr. Woodforde's bull in the **class for colonial-bred Shorthorns**. Mr. H. H. Bawden, of Insiza, shewed an excellent pair of Ayrshire



heifers recently imported from the Union, and Mr. Bennett a bull of the same class. In the North Devon classes, De Beers' imported bulls, though good, were beaten by a colonial-bred animal, the property of the Que Que Farms. Messrs. Fynn, Nelson and Cummings were the principal exhibitors of Africanders, and together made up a very strong class.

The grade classes for heifers were not quite so strong as one would have liked them to be, and were not as a rule well selected. Exceptions to this were two pairs of North Devon heifers shewn by Messrs. Hugh Williams and Coles and Mackenzie respectively. Mr. Edwards, of Daisyfield, put a few good Merinos on the show, and Messrs. Buckly Bros. contributed some recently imported Angora ewes of good quality.

While we congratulate the Midlands Agricultural Society on their show, and fully realise the difficulties of organising such an exhibition successfully, we should like to see, on the next occasion, rather better accommodation in the way of a judging ring, which would add considerably to the comfort of both judges and the public, and prevent unnecessary delay.

Considering the early date of this show and the scanty rainfall, the produce exhibited cannot be regarded as other than satisfactory. A number of the best crop-growing farms in the neighbourhood are only just commencing to be worked on agricultural lines, and in subsequent years the produce classes should be much stronger. There was good competition in the entries for the best 10 ears of maize of the different varieties, and it was noticeable that the quality shewn in 10 row Hickory King and 12 row Salisbury White was much superior to that of 8 row Hickory King. The collections of winter fodder for stock food were particularly good, that of Mr. Leigh, of Hunter's Road, obtaining first prize with special mention. The noticeable feature of this exhibit was the inclusion of such excellent feeds as cowpea hay, ground nut hay and lucerne. The value of these collections of winter fodder lies not so much in the acreage over which each crop is grown, but in the demonstration which they afford of what winter foods can be produced on the normal Rhodesian farm. The omission of linseed, except for two entries from the



Gwelo Demonstration Small Holdings, was noticeable, for this crop provides one of our most valuable feeds, and should be grown for home use on every farm.

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**BULAWAYO AGRICULTURAL SHOW.**—Following closely on the Gwelo show came the Bulawayo Agricultural Society's show on the 27th and 28th of May. As was to be expected after a year of such extreme drought, produce at this centre was hardly up to the usual standard either in quantity or quality. The maize section was not up to that of the previous year, the entries being fewer in number and, as might be expected, owing to the adverse season, slightly poorer in quality. The champion cob—of the Salisbury White variety—was an exceptionally fine specimen, and was grown by Mr. Woods of Bulawayo. An innovation in the way of a competition for the 50 heaviest cobs has nothing to recommend its continuance, and particularly in Matabeleland, where the heavier types of maize, such as Natal White Horsetooth, are unsuited to the prevailing light soil of the country.

One of the most striking exhibits was that of New Zealand oat forage, grown the previous year as a winter crop without irrigation by Mr. Walker, near Lochard. This forage was of excellent quality, and compared favourably with any grown under irrigation. Majorda melons formed probably the feature which appealed most to the public eye, and it is safe to say that no finer exhibit of this most valuable stock feed has ever been shewn in Rhodesia. The entries of these giant cattle melons were very numerous, and their quality left nothing to be desired. In many cases one melon would have afforded a liberal succulent ration per beast per day. The fruit classes were well supported, but here the effects of the drought were most marked, and the quality was hardly equal to that of previous years.

In anticipation of the competition for the 1,000 guinea trophy a large number of stockowners and others had foregathered. The Society has, due largely to the munificent financial assistance of De Beers Co., been able to erect first-class cattle shedding, and generally to increase the scope of its operations. The result was a really fine exhibit of cattle.

which, in the opinion of many competent to judge, compared favourably with those seen at Kimberley and other shows in the Union. A very pleasing feature was that not only was there a large number of first-class and valuable animals, but that many had been bred in Rhodesia or South Africa, and all were presented in a condition which shewed plainly that Rhodesian stock breeders appreciate the value of feeding good stock, and have grasped the right method of doing so.

As at Gwelo, Shorthorns, North Devons, South Devons, Sussex and Africanders were strong features, and, in addition, the Frieslands and Herefords were well represented. The prize for the best Shorthorn bull three years old and over went to Mr. W. C. Morgan's "Ariel Knight," an imported animal of great stamina and shape. The best Shorthorn bull under three years was Mr. W. E. T. Bolitho's "Plutocrat." Messrs. Brebner & Self secured the award for the best South African-bred bull three years and over with "West Acre Beau," a magnificent Red Lincoln, bred on the West Acre Estate by Mr. E. A. Hull, who also won first prize for South African-bred bulls under three years with "West Acre Squire," own brother to "West Acre Beau." Five of Mr. Hull's Red Lincoln cows gained two firsts, two seconds and one honourable mention.

North Devons were represented by De Beers Co.'s "Jack," the best bull in the open class three years and over, and by Mr. St. Charles B. Gwynn's fine imported bull "Northmore Monarch," which was first in the class under three years—beating the two imported bulls from De Beers' Ranche, "Pound Monk" and "Magnet." The Que Que Farms' bull was first amongst the South African-bred bulls three years and over, and, in addition, was awarded the championship certificate. De Beers Co. secured all the prizes for North Devon cows.

Mr. J. G. Hunt of Makwiro topped the list of South Devon bulls three years and over in the open class with a grand imported bull "Nobleman," beating the good bulls belonging to Mr. W. E. T. Bolitho. Mr. W. V. Fleming was awarded a first for his Rhodesian-bred bull "St. Patrick," an extraordinarily well grown animal. Mr. W. E. T. Bolitho had it all his own way with the cows and heifers. Mr. Hunt only



gaining one honourable mention. The Sussex breed were in strong force, pride of place for bulls three years and over going to De Beers Co. for their bull "Lock Toreador," their bull "Ticehurst Confidence II." being placed second. Mr. R. Aserman beat De Beers Co. in the open class, but they again took all the honours for cows and heifers. Amongst the Ayrshires the best bull in the open class under three years was Mr. A. Skey's "Lord William II." Mr. F. Betts was first with South African-bred bulls both under three years and aged, and in the open class for aged cows. Mrs. Butler, Messrs. H. G. Henderson and H. G. Bawden provided the winners in other classes for South African-bred animals. There were several good Friesland bulls exhibited, Mr. F. B. Betts' young bull "Floris" being first in his class and champion, beating such good bulls as Mr. English's "Paul Segis" and Mr. Fynn's "Spike." Mr. W. T. Jackson's "Shamrock" beat Mr. C. R. English's "Daisy Sister" as the best cow three years and over, while the female championship went to Mr. A. H. Mitchell for one of two beautiful heifers recently purchased at Port Elizabeth. Mr. H. Clarke shewed some very nice heifers, but was not fortunate enough to catch the judge's eye for more than an honourable mention. Messrs. Montgomery and Fynn were the principal owners of Africanders. Mr. Montgomery gained first and second with aged bulls and second with aged cows, while Mr. Fynn beat him for both places in the young bull class, for first place in the aged cow class, and again for both places in the heifer class. Some very good Herefords competed. Mr. A. W. Partridge's "Gipsy Boy" gained precedence over Mr. L. Blume's "Hartwick Lad" and Mr. G. Mitchell's "Dauntless," both excellent bulls, in the senior class. Amongst the youngsters Mr. C. S. Jobling's Rhodesian-bred "Devonby Dreadnought" was first, and eventually secured the 1,000 guinea trophy. Messrs. R. Saunderson, Mitchell and Granger were prize takers in other classes. The family class was very gratifying, and excellent collections of the Red Lincoln, Friesland, South Devon, Hereford and Africander breeds were shewn, the first prize going to Mr. E. A. Hull for his family of Red Lincolns. The competition for the trophy was a sight to gladden the hearts of all interested in cattle breeding in this country, and consisted of animals fit to put on any show in South Africa.



After a long consideration the much coveted prize was awarded to Mr. C. S. Jobling's "Devonby Dreadnought," a yearling Hereford bred on his farm Devonby, near Bulawayo, out of the imported cow "Hazel Star," by the imported bull "Banana." This young bull beat some of the best animals that have ever been imported into Rhodesia, and although, in the opinion of some, he might have been a little bigger, Mr. Bradshaw, the judge, stated publicly that he had seldom seen an animal with fewer faults.

An interesting feature of the show was the classes devoted to grade animals, both heifers and oxen, amongst which the outstanding exhibit was Mr. F. E. Woods' three-year-old Aberdeen Angus bullocks. The small stock classes were better filled than usual, the most noticeable exhibit perhaps being some Woolled Persian and half-bred Woolled Persian sheep, the property of Mr. F. D. Walker.

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UMTALI AGRICULTURAL SHOW.—The Umtali Agricultural Society held their show on the 18th and 19th June. Unfortunately, owing to the continued prevalence of African Coast Fever in the neighbourhood, it was again impossible to have a representative show of cattle. With the exception of four bulls sent by Messrs. Barry & English and Mr. A. W. Partridge, there was nothing of note exhibited. Messrs Barry & English, however, shewed two excellent dual purpose Friesland bulls of a strain known as Oldenburgischer Wesermarsch. These have been lately selected and imported for them by Mr. Fischer of Headlands, who also imported one for himself. Although (as one would expect) they shew more excellence from a dairy than from a beef point of view, they certainly approximate more nearly to the dual purpose Shorthorn than do most Frieslands. Mr. Partridge sent his Hereford bull "Gipsy Lad" and a well grown three-year-old Sussex. The small stock were about as usual, but although they were in fair order and condition, nothing called for particular notice.

The Umtali show has always provided a good exhibit of produce, and the present one proved no exception to this rule. One would need to go far to find finer exhibits of maize, beans,

potatoes, citrus fruit and ground nuts. Green lucerne and assorted vegetables were also of high standard. Mr. Swain of Inyazura carried off first and second prizes for his exhibits of 10 ears of Salisbury White maize, which were of particularly good quality, and why this variety, which is now so well recognised throughout the whole of Rhodesia, should not also have been included in the classes for shelled grain is difficult to understand. An excellent innovation was the shewing of potatoes in broad shallow trays instead of in the usual bags. This method facilitates the work of the judges and increases the value of the exhibit from an educational point of view, and we commend it to other show committees. The farmers of the Umtali and surrounding districts have good cause to be proud of the produce they can grow, and while Salisbury and Mazoe farmers rest content without a show of agricultural produce, Umtali holds pride of place in this respect.

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HARTLEY AGRICULTURAL SHOW.—The produce exhibits formed the most important feature of this show, and were both numerous and of good quality, the entries in kaffir corn classes being larger than at any of the other Rhodesian shows which have so far been held. Beans, ground nuts, sunflowers, castor beans, and various kinds of vegetables were strongly represented, while the exhibits of citrus fruit and pineapples deserve special mention on account of their excellence. Shelled maize was of prime quality, and seed ears were also good considering the season. In these classes the best exhibit was one of 10 ears of Salisbury White maize, grown by Mr. Pearson of Makwiro, from pedigree seed, as in the case of prize-winners at several other shows also, purchased from the Department of Agriculture and grown at the Government Experiment Farm, Gwebi. A mistake was unfortunately made in drawing up the maize classes, provision being made for 8 and also 10 row Salisbury White types, which, even if they can be said to exist, should not be recognised. It would be well if the committees of all our agricultural shows devoted greater attention to standardising their prize lists both in live stock and produce classes. Whilst it is highly desirable to give awards for and so encourage new and deserving types or varieties, this can always be provided for by special prizes





Pure-bred Colonial Shorthorn heifer, the property of Mr. G. C. Woodforde,  
Gatooma.



Imported Coates Shorthorn bull, "Prince Worcester," a bull bred almost  
exclusively for dairy purposes.





to be awarded at the discretion of the committee and on the recommendation of the judges. One of the main objects of a show is to bring forward the best individuals of recognised and standard types of live stock or produce suitable to the country, and this is of primary importance as a means of building up uniform grades with a view to export.

The live stock exhibited was on the whole disappointing, although the exhibits of bulls belonging to Mr. G. C. Woodforde of Gatooma and Mr. J. G. Huut of Makwiro, which also took prizes at other shows, and some promising half-bred Herefords shewn by Mr. G. T. Dyke, were very creditable. Half-bred sheep of good quality and extremely fat were shewn by Messrs. Smith & McLellan of Cromdale, Makwiro.

A novel feature at this show was a competition in inspanning and outspanning a span of oxen, which evoked much interest and keen competition between the drivers. The winning span was one belonging to Messrs. Handrick & McCulloch, and the time taken was seven minutes fifteen seconds for inspanning and for outspanning two minutes, which is very quick, especially when it is borne in mind that the manner of handling the animals and the method and neatness of the work were also taken into consideration.

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**SALISBURY AGRICULTURAL SHOW.**—Owing to the fact that the old Salisbury Agricultural and Horticultural Society were unable for various reasons to hold a show, a few gentlemen interested in stock and horses got together at the last moment and held a show of slaughter stock, horses, poultry and implements in the Drill Hall grounds on 3rd July. The show was very successful, and reflected much credit on those who had organised it in so short a time, but it was not a very important one from the cattleman's point of view, and no produce whatever was exhibited. As in the case of Umtali, Salisbury is hampered by African Coast Fever, and only slaughter stock could be shewn. There were three classes for slaughter stock, in which Mr. A. W. Partridge was first and second for the best pair of slaughter oxen, stall fed or otherwise, of any cross other than oxen sired by a pure-bred bull.

In the class for the best pair of oxen sired by a pure-bred bull he was also first with a fine pair of cross-bred Aberdeen Angus steers, beating Mr. F. J. Newton, who shewed a pair of the same breeding and excellent quality, but not equal to the winners in condition. Mr. Partridge also won the championship for the best slaughter ox in the yard judged alive and dead. This ox, which was one of the winning pair in class 2, was between three and four years old, and weighed dressed 734 lbs., the hindquarters and more valuable meat exceeding the forequarters in weight by 42 lbs. The second bullock of the pair was over four years old. He weighed 712 lbs. dressed, fore and hindquarters weighing approximately the same. It was not possible to weigh these animals alive, but from their condition and appearance it is probable that they killed 65 per cent. of carcase to live weight. They had run on the veld entirely until the present winter, and had latterly been brought in with the cows at night and fed. The result goes to prove the value of the grade beast for slaughter purposes, and leads one to speculate on what may probably be done in the not far distant future by Mashonaland mealie farmers, in the way of buying up store cattle and finishing them for the block under a system of combined grazing and feeding.

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IRON MINE HILL GALA.—The show and gala held at Iron Mine Hill brought together the farmers of the locality and their families in friendly rivalry in sporting events and the exhibition of products of their farms. Advantage was taken of the occasion to hold meetings to discuss local matters, while lectures on questions connected with the farming industry were given by members of the Department of Agriculture. The meeting place was at a central spot in the open veld where wagons were lined up and tents pitched. The agricultural exhibits were brought together in an open glade surrounded by wooded hills, an ideal and picturesque spot made by nature for the purpose. The display was a striking proof of the possibilities of the district and a testimony to the energy and ability of its inhabitants, many of whom have only been on their farms for a couple of years. In spite of the difficulties inevitably associated with the commencement of





Natal White Horsetooth mealie, 14-row, grown near Iron Mine Hill. Length 14 inches, weight 26 ozs.; compared with a 12-row Salisbury White cob, 11½ inches in length, grown at the Gwebi Experiment Farm, and an 8-row Hickory King cob.



farming operations in a new district—for five years ago the whole region was unoccupied—there was a very creditable show of produce, both as regards variety and quality.

The maize exhibit was notable for what was probably the finest show of Hickory King maize seen this season, and it was remarkable that the winner at Gwelo had to be content with second place in a class which attracted seven exhibitors. In the maize section was also shewn what is believed to be the biggest maize cob grown in Rhodesia. The variety was Natal White Horsetooth, grown by Mr. van der Plank of Iron Mine Hill; the cob was 14 ins. long, and weighed 26 ozs. It is now lodged in the Agricultural Museum, Salisbury, and a photograph is given of it in this issue, compared with good cobs of Salisbury White and Hickory King. It will be noticed how this variety, although producing occasional cobs of great size and weight, lacks the depth of grain and narrowness of core which are such desirable features of both the Salisbury White and Hickory King varieties, and which make them pre-eminently the mealies for growth under Rhodesian conditions.

A particularly interesting class was that for the best collection of products grown, obtained or made on one farm, and the four entries were a magnificent demonstration of what the district, even in its present early stage of development, can produce. The competition was keen, and the winner, Mr. J. A. Herbert, was closely followed by others, there being on each stand several exhibits not shewn by other competitors. Nothing can indicate more clearly the scope of the farming activities pursued than the following list of articles exhibited, to which it need only be added that the quality of the exhibits themselves was eminently satisfactory also.

Of animal products, there were mutton, venison, sucking pig, turkey, duck, fowl, ham, bacon, lard, milk, cream, butter (fresh and salt), eggs of fowl, turkey and goose, wool, hides, buck-skin, reims, strops and feathers.

In the cereal classes were maize (white and yellow) of sundry varieties, pop-corn, cobs and green mealies; wheat, rye, oats and barley; Boer manna, Japanese millet, kaffir corn of various kinds, rapoko, all as grain and in the sheaf also:



mealie meal, wheat and kaffir corn flour and meal. Of beans there were a score of kinds, including ordinary sorts, as the haricot, Canadian Wonder, kidney and sugar varieties, and, in addition, butter beans, seven year beans, rice beans, ground beans and others less often met with. There were also peas of several sorts, buckwheat, broom-corn, sunflowers, monkey-nuts, coriander seed, teff-seed and buffalo grass seed. Of fresh fodders and hay there were samples of oat sheaves, lucerne, teff-grass, veld hay, millets, mealie stalks, ensilage and tagasaste. Other crops represented were pumpkins, marrows, melons, and pumpkin seed, tobacco, Up-to-date and Early Rose potatoes, and artichokes. Vegetables were represented by over twenty-five varieties comprising cabbage, potatoes, sweet potatoes, peas, wax beans, broad beans, onions, shallots, beetroot, mangold, parsnip, radish, horse radish, kohl-rabi, carrots of three kinds, tomato, eschalots, thyme, mint and other sweet herbs, endive, lettuce, cucumber and egg plant. Fruits included apples, oranges, naartjes, Cape gooseberries, Indian sorrel and granadillas. The display was indeed creditable when it is remembered how young is the district.

Indoor activities were represented by exhibits of bread (white and brown) made from wheat, kaffir corn and maize, some grown on the farm; besides fancy bakings of scones, cakes, rusks and buns; jams, jellies, marmalades, bottle fruits, chutneys and pickles. Imitation ginger and bottled honey formed attractive exhibits, whilst hop beer, ginger beer and lemon syrup were conspicuous features.

There were woodwork exhibits of farm made yokes, skeys and brick moulds, while home-made soap was in evidence. The stands were decorated with veld and garden flowers, and the general effect was very pleasing.

This extensive list of exhibits might even perhaps have been added to, and in future years it will no doubt be increased, but no one could inspect the various tables this year without being profoundly impressed by what has been achieved in so short a time. An excellent start has been made, and we feel sure that the future holds great promise for this enterprising and progressive district.

VICTORIA AGRICULTURAL SHOW.—The first show ever held at Victoria brought out, as at Iron Mine Hill, the potentialities of that great tract of country which the railway—newly opened—will now bring into easy communication with the rest of the Territory. The show was held on the 11th of July, and gave testimony most forcibly to the fact that at present Victoria is pre-eminently a cattle country, and that in spite of drawbacks, owing to remoteness, considerable progress has already been made in the improvement of herds by the use of imported bulls. It was noticeable that Hereford and Devon grades were of excellent quality, combining the advantages of improved form with the hardiness of their maternal ancestry, for though the show was held at a late season in the winter, and after severe cold had told upon stock in general, yet these classes were in good condition, contrasting in this respect conspicuously with the pure and cross-bred Shorthorns and Frieslands exhibited. There was a creditable collection, too, of Ayrshires, a breed not often met with as yet, and Mr. Struthers deserves special mention for his enterprise in this direction. The cup for the best bull was gained by Mr. P. Forestall's imported three-year-old Hereford bull, after close competition, the reserve going to a very nice imported Devon bull owned by Mr. Struthers. Apart from spans of oxen, there were upwards of a hundred head of horned stock exhibited—a very satisfactory beginning, especially when it is remembered that all the animals had to travel on foot great distances, some over fifty miles, to reach the show yard.

After the judging a demonstration of the points of beef and dairy types of cattle and of the special features of different breeds was given, whilst at the farmers' dinner in the evening the discussion turned on the same theme.

The produce section of this show was undoubtedly one of its best features. Three classes in particular reached a very high standard of excellence—potatoes, maize and citrus fruit. There was a satisfactory display of other lines, including sheep and poultry of all kinds, while in addition there were ring events and a sale of stock.

Perhaps the most encouraging features were the large attendance of farmers and others, and the keen interest

evinced in the business side of the show as compared to the popular attractions at the larger shows, which, though necessary to secure a gate, undoubtedly militate against a prime object—the educational side of our shows.

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**THE OIL FACTORY.**—As has been announced in the Press, the British South Africa Company has, through its Commercial Branch, taken over in its incipient stage the oil factory in course of establishment by private enterprise in Salisbury. As is generally known, it was the intention of the Board to provide such a factory in order to give an opportunity of testing the possibilities of the cultivation of oil crops for profit, and thereby to add to the scope and variety of farming possibilities in Rhodesia. When, however, individuals offered to establish privately such a concern it was felt to be undesirable in any way to discourage such enterprise or to compete with so praiseworthy an effort. Some outcry has arisen amongst intending producers of oil seeds, who realise that in its initial stages an industry of this description may require treatment such as a strictly commercial firm could hardly be expected to give in order to ultimately establish it successfully. It should, therefore, please all concerned to know that the parties in question have agreed to withdraw from the undertaking, which will be taken over and managed by the British South Africa Company.

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**MOLASSES AS STOCK FEED.**—In our advertisement columns it will be seen that the Rhodesia Trading Co. are offering molasses in small consignments at a much lower price than hitherto obtainable in Salisbury. We have on former occasions pointed out the value of the product as a stock feed, especially in the case of imported animals or dairy cows, at times when green or succulent food is scarce. At its present price of approximately 1½d. per lb., 4 lbs. per day to a good milch cow in a whole-milk business is not too costly, and if fed with mealie meal, etc., would be found to augment the milk supply considerably.



**THE RHODES TRUST EXPERIMENTS.**—Mr. J. G. McDonald of Bulawayo has recently issued, on behalf of the Rhodes Trustees, the fourth report on “certain work and experiments carried out on the Matopo and Inyanga Estates.” The report follows the lines of previous publications by the same writer, and indeed contains several repetitions of the same matter together with some further notes and new items. The booklet opens with a comparative table shewing the average rainfall in different districts of Rhodesia as contrasted with that of various parts of Europe and Australia, and the writer urges that greater attention should be devoted to water conservation for irrigation, and greater care taken to work the land so as to make the utmost of our rainfall during the months when it occurs.

Mr. E. A. Hull’s reports on live stock breeding and management contain many useful hints to stock-breeders, as do Mr. H. C. Michell’s paragraphs on sheep at the Inyanga farms. Mr. W. E. Dowsett contributes his usual excellent report on afforestation work at the Matopo Park, and thereby supplies a valuable guide to Matabeleland farmers who are interested in tree planting. Other of the more important chapters are devoted to fruit growing by the author, dry farming in Canada, from “Dalgety’s Review,” and insect notes extracted from the “Union Agricultural Journal.”

In discussing the maintenance of soil fertility, Mr. McDonald regrets that farmers are not giving this matter greater thought, and that the Agricultural Department is doing a little but not very much in this respect. He is apparently unaware of the keenness with which the use of artificial fertilisers has been taken up by numerous farmers in the maize belt of this country, as testified by the phenomenal increase of the annual importation of this commodity, nor can he have taken notice of the reports of manurial experiments conducted by the Government Agricultural Chemist, and the frequent discussion of these subjects at farmers’ meetings. The question of soil fertility as influenced by crop rotation is also receiving much thought and practical application wherever arable farming is being actually pursued. It would have been interesting in this connection to have learned what the Rhodes farms are doing to ascertain

which is the most profitable fertiliser to use for different crops under their particular circumstances.

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**RAILWAY CONCESSIONS TO FARMER SETTLERS.**—The concession of half rates for live stock and vehicles granted to farmer settlers over the Vryburg—Mafeking section of the Rhodesia Railways has been withdrawn. The concession granted in respect of breeding stock imported into Rhodesia is also cancelled as far as the above-mentioned section of line is concerned.

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**THE CHIEF VETERINARY SURGEON.**—Mr. J. M. Sinclair, Chief Veterinary Surgeon, is absent on vacation leave in England, and will attend the forthcoming International Veterinary Congress in London to represent Rhodesia. He will also make personal investigations regarding the testing and immunisation of cattle for Rhodesia in England prior to shipment, reference to which is made elsewhere. During his absence the duties of the post will be performed by Mr. C. R. Edmonds, the Assistant Chief Veterinary Surgeon.

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**FORESTRY.**—An addition to the staff of the Department of Agriculture has been made by the appointment of a Forestry Adviser, a step long contemplated and one strongly urged at the last Agricultural Union Congress. Mr. J. J. Boocock, who was for a number of years attached to the Union Forestry Department, has now assumed his duties, and all interested in questions relating to the conservation of indigenous forests, the establishment and care of plantations, or the use of timber and kindred questions are invited to communicate with him.

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**AGRICULTURAL CO-OPERATION.**—Mr. E. Wilson, President of the Rhodesian Agricultural Union, who is one of the fifty farmers now touring England and Holland, has been presented with a cheque by the Salisbury Farmers' Co-operative Society as a recognition of his long and valued services. The

gift is especially made to enable him to proceed to the United States of America to study there the methods of handling the maize crop and the principles of co-operation in production. We congratulate both Mr. Wilson on this well-deserved compliment and the members of the Society on their graceful act, which we feel assured will redound to the advantage of the farmers of Rhodesia.

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MANURIAL EXPERIMENTS WITH MAIZE.—We would especially draw the attention of our readers to Mr. Blackshaw's article dealing with the manuring of maize at the Gwebi Experiment Farm, appearing in this issue. This is the third year of the experiments, and the results obtained are highly satisfactory. The object of the trials was to test the effect of various compositions of fertilisers on the common red soil of this country, and to ascertain how long the effect of artificial fertilisers could be observed in subsequent crops. The largest total increase in three successive seasons resulting from one application of fertiliser was 2,087 lbs. (10 bags) for an expenditure of 32s. 6d., and this we think will appeal very convincingly to all who study the figures Mr. Blackshaw gives.



## Extracts from the Report of the Chief Veterinary Surgeon for the Year 1913.

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For another year it has to be recorded that the most important work which engaged the attention of the officers of the Veterinary Department was in connection with African Coast Fever. The recrudescence of this disease on several old centres of infection, after various periods of apparently entire immunity, caused no little uneasiness amongst the cattle owners of the districts immediately concerned. Nevertheless, the position at the close of the year is more favourable than for several years past, because the infection has been restricted to these outbreaks, and the formerly large infected area around Bulawayo is now reduced to two centres only on which disease occurred during the year. In other respects the Territory is remarkably free from disease of an epizootic nature.

In addition to dealing with the scheduled infective diseases of animals, the work of the Department includes—

- (1) the control, by means of permits, of all cattle movements;
- (2) the supervision of cattle dipping tanks at the centres where public tanks have been constructed, and on various areas where dipping for Coast Fever purposes is compulsory;
- (3) the supervision of the areas established for slaughter cattle at the larger centres;
- (4) the application of the tuberculin test to all animals imported from countries other than the Union of South Africa;
- (5) the application of the mallein test to all equines imported;
- (6) the general inspection of all animals imported;

- (7) the inoculation against redwater and gallsickness of imported susceptible animals;
- (8) advice and assistance to farmers on stock matters generally.

**AFRICAN COAST FEVER.**—During the year six outbreaks occurred, and a total mortality of 172 head, compared with five outbreaks and a total mortality of 505 during the previous year. A schedule is attached hereto shewing the areas on which the disease occurred and the mortality at each, also a comparative statement of the numbers of fresh outbreaks and mortality for the preceding seven years.

*Umtali District.*—At the beginning of the year one infected centre existed, viz., the Umtali commonage, on which the last case of Coast Fever occurred in March, 1912. No further cases were recorded, and the area is now regarded as clean.

Two fresh outbreaks occurred, viz., on the farms N'Odzi and Mabonda, north of Penhalonga, and in the same ownership. The former was detected towards the end of April, and it was soon apparent that a gross infection existed, as during the first five weeks over 40 head were destroyed, the majority shewing lesions of Coast Fever, either macroscopically or microscopically. It was impossible to treat the herd by removal to clean veld on the temperature camp system, and it had to be left on the infected veld, and an attempt made to eradicate the disease by dipping every third day. The results have not been satisfactory, although the greatest attention was paid to the process of dipping, in addition to which all ears and tails were regularly dressed. Temperatures were taken daily, and every animal shewing an elevation was isolated until a definite re-action was established, when it was destroyed. The total mortality to the end of the year was 121 head, distributed as follows: April, 9; May, 40; June, 8; July, 35; August, 6; September, 8; October, 9; November, 1; December, 5. There is no doubt that the disease had existed on this farm long before it was discovered. Dipping had been practised for several years, but there is good reason for stating that during the owner's absence for nearly a year prior to the discovery of the outbreak, the fluid in the tank had not

been properly attended to, and had become so weak as to be useless for destroying tick life.

In October a beast was reported dead at the farm Ma-bonda, about 10 miles north of N'Odzi, and the existence of Coast Fever was clearly demonstrated, both macroscopically and microscopically. The herd was removed to clean veld, and three-day dipping, which had been instituted when the outbreak occurred at N'Odzi in April, carried on, with the result that, although over 400 head were involved, no further cases have occurred.

In October smears from a calf on the Jelf Estate shewed Koch's bodies. This animal shewed no temperature and no symptoms of ill health, and smears taken subsequently proved negative. It was afterwards destroyed by the owner, and *post-mortem* and microscopic examination shewed no signs of Coast Fever. The herd has been kept under constant observation, but no further suspicions of Coast Fever have been detected. As the presence of the microscopical bodies known as "Koch's" or "blue bodies" is generally regarded as conclusive evidence of Coast Fever, it is difficult to explain their casual occurrence in a calf belonging to a herd which has been free from this disease for ten years. I am inclined to think that in such cases there has been an error somewhere, perhaps in observation, or more likely in the mixing or misplacement of the preparations from which the diagnosis was made. At any rate, until more definite evidence of the existence of Coast Fever is forthcoming in this case its existence will not be declared.

*Goromonzi (Salisbury) District.*—From the previous year one centre of infection remained, viz., a portion of the northern section of Salisbury commonage. No fresh cases occurred during the year, although the animals were not removed from the veld on which the disease occurred. The total loss in the herd affected was two small calves only.

Four fresh outbreaks occurred, viz.—

- (1) on the farm Grange, eight miles east of Salisbury;
- (2) on the Hatfield Estate, adjoining the Salisbury commonage on the south;
- (3) on the southern section of the Salisbury commonage;
- (4) on the farm Hayden, 12 miles west of Salisbury.



At the first-named centre several calves were reported ill on 1st January, and *post-mortem* examination in one instance revealed lesions of acute redwater and anaplasmosis only. Veterinary Surgeon White, in inspecting the herd, noticed a two months old calf with enormously enlarged glands, those below the ears especially attracting attention; in other respects the animal appeared perfectly healthy. Smears taken from one of the glands shewed the presence of innumerable Koch's bodies. The calf was isolated and blood and gland smears examined daily. The Koch's bodies persisted until death, but no *T. parva* was detected in the blood at any time. *Post-mortem* examination shewed most characteristic lesions of Coast Fever, especially in the kidneys, which were profusely infarcted. The farm was fenced immediately, and the herd sprayed every third day, until the completion of the dipping tank. No further cases occurred, and the quarantine was raised at the end of the year. In April the disease was discovered in a small dairy herd on the Hatfield Estate. The infection proved to be very gross, and within a short period three small adjoining herds became infected. The mortality persisted, and as there appeared to be little possibility of saving any of the animals, the survivors were destroyed in November. The estate was fenced soon after the outbreak was discovered. In August a herd on the southern commonage became infected, and in September another. The infection in these cases appears to be slight, as only four animals have been infected so far. This, no doubt, is due to regular dipping both before and after the appearance of the disease. During August an ox died on the farm Hayden. *Post-mortem* and microscopic examination shewed Coast Fever. Fortunately the farm was fenced, and the cattle had been dipped, though not at regular intervals. No further cases have occurred to date.

*Bulawayo, Umzingwane and Matobo Districts.*—At the beginning of the year there were eight areas regarded as infected, and no fresh outbreaks occurred. On 1st May four of the areas referred to were released from quarantine, after a period of at least 15 months' freedom from disease. At the remaining four areas, disease occurred at two only during the year, viz., a portion of the Wollendale Estate and the farm

Collaton, where the last cases of disease were recorded on 11th February and 29th May respectively.

*Bubi District.*—No fresh cases occurred on the single farm infected in this district during the previous year, and after the usual period it was released from quarantine.

On reference to the schedule, it will be seen that 164 deaths out of the total number of 172 occurred at three centres, viz., N'Odzi, Hatfield Estate and Collaton. In the two former, the disease had existed for a considerable period prior to its discovery, consequently the veld was grossly infected, and, as there were no suitable clean areas to which the herds could be moved, we were compelled to allow them to remain, and endeavour to eliminate the disease by three-day dipping and the destruction of all animals shewing a suspicious rise of temperature. The results did not prove satisfactory. The disease still persists at N'Odzi, and the Hatfield herds were slaughtered, as there seemed to be little prospect of saving any. At Collaton twelve animals were destroyed during the first five months of the year, since when no further cases have occurred. This outbreak occurred in February, 1912, and during that year 409 animals succumbed. It would appear, therefore, that the eradication of infection is within sight.

The heavy mortality and the persistence of infection in the N'Odzi and Hatfield outbreaks caused a good deal of adverse comment on short-interval dipping as a means of dealing with cattle on infected veld, and also of dipping as a general preventive measure, because in the former case it had been, or was alleged to have been, practised for some years previous to the outbreak. As a preventive measure, dipping is of little or no value, unless regularly carried out in a solution of proper strength, which certainly was not done at N'Odzi for at least twelve months previous to the discovery of the outbreak. That it is not an absolute preventive is evident from the Mabonda outbreak, where the animals had been dipped every third day in a solution of proper strength, for several months previous to the outbreak. It is more than certain, however, that but for its consistent application before and after the appearance of the disease, the loss would not have been restricted to one beast.



Apart from the question of dipping as a general preventive measure, its efficacy in dealing with herds running on infected veld depends to a very large extent on the degree of infection which exists when the outbreak is discovered, and the short-interval dipping policy initiated. Where gross infection exists, the losses are invariably heavy, and the eradication of infected ticks a slow process, but where the first case of disease has been detected and dipping immediately practised, the results have been highly satisfactory, *e.g.*, the Grange and Hayden outbreaks, where the loss was restricted to one beast in each case.

Early in January the weekly dipping of upwards of 30,000 head of cattle in and around the infected and suspected areas in the Bulawayo, Bubi and Umzingwane and Matobo districts was begun, and carried on until the beginning of the winter season. This measure has undoubtedly contributed to the very satisfactory position which now obtains in Matabeleland, *viz.*, two infected centres only, one of which has been free from disease for over ten months and the other for over seven months.

It is satisfactory to be able to record a substantial increase in the number of dipping tanks in the Territory. The total number in use is now over 370.

**BOVINE PLASMOSES.**—The direct and indirect losses caused amongst cattle imported from the Union of South Africa and overseas by the diseases included under this term, *viz.*, piroplasmosis or redwater and anaplasmosis or gallsickness, continue to be a serious drawback to the stock-raising industry. Amongst locally-bred graded cattle, too, the losses are considerable, compared with those of pure native or Africander strains. It is impossible to obtain statistics in regard to the mortality amongst Colonial-bred animals, but it is certainly well over 10 per cent. During the year 94 animals from Great Britain were inoculated, of which 27 head, or nearly 29 per cent., succumbed. The mortality in one consignment was particularly heavy, 16 out of 33 dying between the 35th and 40th days after inoculation. The blood used for the inoculation was taken from an animal which had given a comparatively mild virus during the previous year, and there is no doubt that since then its virulence has been exalted,



probably by natural infection through tick-infected bedding. The very heavy mortality in the lot referred to was to some extent due to a spell of excessively hot weather which occurred whilst the animals were suffering from the very severe anaplasmosis re-actions. In addition to the losses from inoculation, several animals died from acute redwater on exposure to veld infection, shewing that little or no immunity to this disease was conferred by the inoculation. Amongst the animals imported from overseas during the year and not inoculated several deaths have occurred to date from redwater and gall-sickness. In all cases the animals are carefully looked after, and either stabled or confined to enclosures to avoid, as far as possible, tick infection. They are also regularly dipped or washed. These results so far are most encouraging, and shew that by careful management it is possible to prevent susceptible animals contracting either disease. The facilities for attaining this result are, however, generally beyond the means of the average farmer. Further research is now being undertaken, with a view to elaborating a mild virus which will confer such a degree of immunity as will permit of the average farmer obtaining pure-bred animals, bulls especially, and exposing them with safety to ordinary farm conditions.

**BLACK QUARTER OR QUARTER EVIL.**—One outbreak on a farm in the Umtali district was recorded. Only one death occurred.

**TUBERCULOSIS.**—Two outbreaks of tuberculosis in cattle were dealt with during the year. In the first case, *post-mortem* on an aged cow purchased on the Gwelo stock sale a short time before death shewed lesions of advanced tuberculosis. On enquiry, it was found that this animal had been in the possession of the vendor for four years. The examination of the animals in this herd and the application of the tuberculin test failed to locate any further cases. The second outbreak occurred in the Nyamandhlovu district in a herd of well-bred animals. The first case detected was in an imported cow which had been on the farm for several years. *Post-mortem* shewed marked lesions of tuberculosis. The incontact animals were tested with tuberculin, and two re-acted, *post-mortem* examination in each case shewing tuberculosis. All the cattle imported from overseas during the year were tested with tuberculin. Two re-acted and were destroyed.

TRYPANOSOMIASIS.—In the Hartley district there was a considerable increase in the number of cattle affected with this disease, compared with the previous five or six years. This is probably due to the large increase in the number of cattle in the district, and to the use of oxen in opening up certain areas for mining purposes. As far as can be judged, there was no increase in the numbers of tsetse fly in the Hartley and Gatooma areas, and no extension of the areas infected by them. In the Lomagundi district a serious extension of tsetse fly areas is reported.

RABIES.—A marked decrease in the prevalence of this disease has to be recorded. Only one confined outbreak occurred during the year, viz., in Salisbury township, where four dogs and one ox were destroyed. One suspected case was reported from Umvuma and two from Victoria. This improvement in the position, as compared with previous years, I attribute to the application of the Dog Tax Ordinance, which has resulted in an enormous diminution of native dogs throughout the Territory.

GLANDERS.—The Territory remains free from this scourge. During the year the following animals were tested with mallein on importation:—Horses, 1,000; mules, 741; donkeys, 2,495. Three horses re-acted. *Post-mortem* examination in each case shewed lesions of glanders.

RINDERPEST.—Early in the year the Assistant Chief Veterinary Surgeon was despatched to German East Africa, with the permission of the Governor of that Territory, in order to make direct enquiry into the conditions in regard to rinderpest. He was received with every courtesy, and given every facility and information in prosecuting his enquiries, for which we are greatly indebted to the officials of that Administration. The disease is being combated on scientific lines by a large and well-equipped Veterinary Department, and it is most satisfactory to learn that during the last twelve months the disease has not extended southwards. At the same time, it must be stated that until it is entirely stamped out it is a danger to the territories to the south. A Conference of Veterinary Officers was convened by His Excellency the High Commissioner, and met at Bulawayo in April, to consider Mr. Edmonds's report, and what steps were necessary to prevent

the disease spreading to any of the adjoining territories, and the means to be adopted in dealing with it should it unfortunately invade such territories. The Conference was attended by delegates from the following Administrations:—The Union of South Africa, Swaziland, Basutoland, Bechuanaland Protectorate, Nyasaland, Portuguese East Africa, Mozambique Company's territory, Belgian Congo, British East Africa, and Northern and Southern Rhodesia.

IMPORTATION OF STOCK.—From Great Britain—110 bulls, 121 heifers; from East Friesland—3 bulls; from Cape Province and Orange Free State—636 bulls, 5,964 heifers; from Portuguese East Africa—93 head of slaughter stock; from Northern Rhodesia—3,312 head of mixed cattle.

|                        |        |
|------------------------|--------|
| Horses ... ..          | 1,000  |
| Mules ... ..           | 741    |
| Donkeys ... ..         | 2,495  |
| Sheep and Goats ... .. | 60,574 |
| Ostriches ... ..       | 116    |

### SCHEDULE.

#### AFRICAN COAST FEVER, 1913.

| District                   | Area                | No. of Deaths | Date of Last Death |
|----------------------------|---------------------|---------------|--------------------|
| <i>Fresh Outbreaks—</i>    |                     |               |                    |
| Umtali ...                 | Farm N'Odzi ...     | 121           | Dec. 31            |
| do. ...                    | do. Mabonda ...     | 1             | Oct. 10            |
| Salisbury ...              | do. Hayden ...      | 1             | Sept. 25           |
| do. ...                    | do. Grange ...      | 1             | Jan. 1             |
| do. ...                    | Hatfield Estate ... | 31            | Nov. 17            |
| do. ...                    | Salisbury Commonage | 4             | Sept. 13           |
| <i>Existing Outbreaks—</i> |                     |               |                    |
| Bulawayo ...               | Farm Collaton ...   | 12            | May 29             |
| do. ...                    | do. Wollendale ...  | 1             | Feb. 11            |

|                  | 1906 | 1907 | 1908 | 1909 | 1910 | 1911 | 1912 | 1913 |
|------------------|------|------|------|------|------|------|------|------|
| No. of outbreaks | 6    | 7    | 4    | 7    | 18   | 8    | 5    | 5    |
| Mortality ...    | 752  | 358  | 290  | 196  | 347  | 1036 | 505  | 172  |



## Extracts from the Report of the Veterinary Bacteriologist for the Year 1913.

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During eight months of the present year the Government Veterinary Bacteriologist was absent on vacation leave. A special extension of two months enabled him to study in Great Britain the recent advances in veterinary science. In his absence no special research work was performed, but the examination of smears and the inoculation of imported stock was undertaken by District Veterinary Surgeon Williams.

EXAMINATION OF PREPARATIONS.—The number of smears submitted for diagnosis did not exceed that of the previous year, but in view of the increase of the Veterinary Staff, and the greater appreciation on the part of the public of this aid to diagnosis, this must be regarded as evidence of a decrease of animal sickness throughout the Territory.

AFRICAN COAST FEVER.—Several outbreaks have occurred during the year, many of them offering very puzzling features. In more than one instance a single case has cropped up, generally in a young animal; or an outbreak has recurred on an old infected area, which, according to the accepted theories held concerning the disease, should long since have been clean. These, in the light of our present knowledge, are hard to explain, and suggest that the ætiology of the disease is not yet fully understood. Several explanations are offered; one, that an endemic form of the disease, akin to that known as amakebe in Uganda, and described by Bruce, exists in this country; another, that recovered or "salted" cattle serve as a reservoir of infection. The question is one of considerable importance, and requires early and exact investigation.

PLASMOSES OF CATTLE.—During the year the increasing importance of anaplasmosis has been remarkable. The mortal-

ity caused by this disease in young improved stock and in cattle from overseas, and the loss in growth and development directly or indirectly attributable to it, render it one of the greatest handicaps to stock raising in this country. The monetary losses due to it are enormous, and, with the breeding up and so-called improvement of indigenous stock, will increase from year to year; for it must be pointed out that, while the indigenous cattle of the country enjoy a marked resistance or tolerance, this is considerably reduced in their progeny when imported bulls are mated with them. So with every strain of improved blood imposed, the greater is the susceptibility and the higher the mortality of the young stock. Anaplasmosis is closely associated with piroplasmosis or redwater, but while the former is comparatively well understood and can be eradicated by dipping, or treated with a specific remedy in the form of trypan-blue, very little is known about anaplasmosis, which has up to the present resisted all forms of treatment. It is felt that every effort should be made to obtain as soon as possible a thorough scientific knowledge of the subject, in anticipation of the improvement and progress in stock raising which the present activity would indicate. During the year 94 cattle from Great Britain were inoculated by D.V.S. Williams, with a mortality of 27. The greatest number of deaths occurred in one consignment, 16 out of 33 dying between the 35th and 40th days after inoculation. All these animals had been inoculated with the blood of a standard bleeder bull, which had previously yielded a comparatively mild virus. On testing this blood, it was found that, in addition to containing piroplasms and anaplasms as hitherto, it contained also spirochaetes, which complicated the anaplasmosis re-action. This new element in the virus suggests that the bull must have contracted a natural infection, probably from tick-infested bedding. No losses have occurred during the inoculation of cattle from the southern territories, but the standard of these animals is much inferior to those from overseas, and in many cases does not justify their use for stud purposes. An effort is now being made to elaborate a new standard virus of low virulence, and until this can be done the importation of pedigree cattle from overseas is fraught with serious dangers, and is a hazardous and unprofitable proceeding. It is hoped to obtain such a



virus or vaccine that the stockowner himself may inoculate his own animals and may immunise his young stock without any serious mortality.

**HORSE-SICKNESS.**—During the first few months of the year interesting experiments were performed in connection with the process of immunising horses against horse-sickness. The results were at the time considered highly satisfactory, such an immunity being conferred as to render the horses resistant to enormous doses of a certain virus. Unfortunately, on the completion of these experiments, these animals had to be sold by public auction on the open market, with the result that many of them fell into the hands of careless owners who took little or no care of them, and exposed them by night and by day to the risk of infection. Many of these animals cannot be traced, but it is certain that quite a number of them died of horse-sickness. On the other hand, some half-dozen were purchased by men who have treated them fairly. On exposing these animals, it was found that most of them contracted the disease naturally or suffered from relapse, but with ordinary care and nursing recovered, and have since resisted the disease during one of the worst seasons on record. The only explanation that can be offered is the well-known observation by Dutchmen, confirmed by Sir Arnold Theiler's work, that the strains of virus differ in different districts, and that a horse "salted" in one district may contract the disease in another. This difficulty cannot be overcome until a more exact knowledge of the virus of horse-sickness can be obtained by patient research and costly experiment.

**TRYPANOSOMIASIS.**—Recently a very heavy infection has occurred amongst trek oxen working in the "fly" area in the Hartley district. Some 30 animals have been treated with very favourable results, the trypanosome disappearing after the first injection and not re-appearing, the animals rapidly improving in condition. It is too early to announce complete recovery, but the fact that these favourable results have been obtained in spite of the heavy rains which have prevailed throughout the period of treatment leads one to hope for ultimate success. It is to be regretted that the same treatment cannot be applied to pigs, a number of which are infected on a farm near Hartley, but experiments are being conducted



with a view to the discovery of a modification applicable to these animals. The investigations commenced in 1912 in connection with the trypanosomiasis of man and animals in the Sebungwe district were continued at the commencement of the present year. The resemblance of the parasite met with in man, waterbuck, dogs and goats in the infected area to that known as *T. rhodesiense* was pointed out. Early in March two rabbits containing a strain of trypanosomiasis, originating from a natural case of nagana in a mule from Soimkele, Zululand, were kindly forwarded to this laboratory by Mr. Wm. Robertson, Acting Director of the Government Veterinary Bacteriological Laboratory, Pretoria. Two days after the arrival of these animals, it was remarked that in many of the parasites the nucleus was placed in the posterior position held to be characteristic of *T. rhodesiense*. This was pointed out to Dr. Robertson, and about the same time Surgeon-General Sir David Bruce, working with this strain, drew attention to the same characteristic. As the result of these and similar observations, it is now thought that the so-called *T. rhodesiense* is nothing more or less than a strain of *T. brucei*, possibly modified by transmission and other circumstances, and the statistics of the Medical Department shew that the infection of man is by no means as common as the deductions of Kinghorn and Yorke would lead one to expect. A sheep found in a kraal in the Mafungabusi district was forwarded by Dr. Stohr to this laboratory, and was found to harbour in its blood a trypanosome which has now been recognised by Bruce as that described as *T. capræ*. A similar parasite has recently been found in an ox in the Gatooma district.

## Citrus Fruits.

### THE PREPARATION OF ORANGES FOR MARKET.

By CHAS. E. FARMER, Citrus Adviser to the B.S.A.  
Company.

It has been found necessary, in all countries where fruit of any kind is grown on a scale large enough to constitute it a marketable crop, to adopt uniform methods of preparing it for market. The methods relate more especially to the size and kind of package to be used for each variety of fruit and to the particular way of placing it in the package. As regards deciduous fruits, the methods adopted in any particular country or district of a country are those which experience proves to be best suited to the particular markets to be catered for and to the means of transporting the fruits to those markets; therefore, no attempt has been made to make these methods uniform in all countries or in all districts. For this reason, apples, pears, peaches, etc., some of which are grown in nearly all countries for local and distant markets, arrive at their destination in boxes, barrels, baskets and crates of many sizes and shapes, each having some particular merit of its own in its district and adopted on that account.

Citrus fruits, requiring, as they do, more certain climatic conditions for their cultivation, are limited to particular districts of certain countries only. These districts being situated at very long distances from the markets for which the fruit is grown, more uniformity prevails, especially among the newer countries, in the methods adopted for placing these fruits before the public.

In several of the Provinces of the South African Union the selling of these fruits in the local and European markets

has now become one of the recognised industries of the country, and certain rules and regulations to be observed in the preparation of the fruit for the European markets have been made compulsory and are enforced by the inspection of every consignment by an official appointed by the Government for the purpose at each port, with power to prohibit the export of any consignment not packed in conformity with those rules and regulations. In setting up this standard, the South African Union has adopted the size of box and the particular methods of packing the fruit obtaining in the citrus fruit districts of the United States of America, and which were found, after many years of experiment by the growers in America, to be the most satisfactory methods of packing the fruit for conveying it over long distances by rail and sea and placing it in a convenient and attractive way on the markets. Citrus fruits prepared in accordance with these rules and regulations and passed by the Government Inspector are now carried in the cool chamber of the steamers of the Union-Castle Line from Capetown to Southampton at the rate of 25s. per cubic ton. Any consignment condemned by the Inspectors is placed in the hold of the ship and carried, I believe, at no uniform rate of freightage, the very good object in view being to prevent inferior, unripe and badly packed fruit going to the oversea market and creating a bad impression, to the detriment of the whole industry.

With these explanatory remarks, I will endeavour to give some information as to the method of preparing oranges for market, and these remarks do not apply to the method of packing the "kid glove" varieties, known generally as naartjes, or to the curing and packing of lemons, the latter fruit requiring very different and more elaborate treatment before being placed in boxes.

*Time to Gather the Fruit.*—Oranges should not be taken from the trees until they have attained the real orange colour, which betokens ripeness, sweetness and good flavour. If gathered while green and unripe, fruit may change colour with keeping, but it will be a light yellow and not the rich natural colour, and the flavour will be insipid and poor, and oftentimes inclined to be bitter. If growers follow this practice largely, it soon gives their fruit a bad reputation in the markets. There is no necessity to market unripe oranges.



they can be allowed to ripen on the tree, and, if properly handled, will carry equally well. This applies especially to the mid-season and late varieties such as the Washington Navel and Valencia Late, which retain their keeping qualities longer after ripening than some exceptionally early kinds such as the Early Boone and Parson Brown. If left on the tree too long after ripening, all varieties will of course become deficient in juice, and there will be a loss from dropping. The weather should be fine, and the dew allowed to dry from the trees before gathering commences.

*Appliances Required.—Clippers.*—Fruit that is pulled from the tree will have the rind broken and injured, causing decay to commence very soon. It is necessary, therefore, to use clippers for gathering them, and these are made with the blades curved to facilitate cutting the stems close up to the calyx without injuring the rind. The calyx remains on the orange, and is one of the hall-marks of properly handled fruit; but no protruding stub must be left, or it will puncture other fruits coming in contact with it. The clippers as supplied for this work are shewn in fig. 1.

*Picking Baskets or Bags.*—The pickers require something in which to put the fruit as they gather it. The most satisfactory receptacle on the market is a wicker basket made flat on one side to fit against the back, and is slung across the shoulder with a strap, the front of the basket being rather higher than the back. The inside is padded to prevent bruising. A basket protects the fruit perfectly from being bruised after it is picked, and for this reason is better than a bag, which often swings and strikes against the steps or ladder, although a very convenient bag is made with strong duck and fashioned to let down and allow of the fruit being emptied into the "grove box" through the bottom without injury. If baskets are used, the fruit should be taken out and put into the "grove box" by hand and not poured out.

*Grove Boxes.*—These are provided for the pickers to empty their baskets into from time to time. No particular pattern is necessary. They are usually made about 13 inches wide by 14 inches deep by 27 to 30 inches long, and without the centre division required in the market boxes. The sides and bottoms are of half-inch slats, six inches wide, with inch

spaces left between them and at the corners for ventilation purposes, hand-holds for lifting being cut out of the ends about two inches from the tops. To strengthen the boxes, they should be bound with light iron hooping at the ends. The pickers should be warned not to fill the grove boxes so full that the fruit lies higher than the top of the sides, so that they can be placed on a wagon one on the other in tiers without injuring the top fruits while carrying them from the grove to the packing house. Also, when filled, they should be moved to the shade of the trees while waiting to be loaded.

*Steps or Ladders.*—The object of present-day fruit growers is to cultivate the low-headed, wide-spreading tree, and to grow fruit at such a height that it can be gathered from steps, avoiding the use of ladders as much as possible, which damage the tree and fruit and take more time and muscle to move about. The best style of step ladders are those made very broad at the base and supported by a single prop only.

*Curing the Fruit.*—This is a simple matter and requires no specially contrived building or experienced labour, as is the case with lemons. When oranges are first taken from the tree, the cells on the rind are filled with water and expanded to their full extent, causing the rind to be brittle and the cells easily broken. In this condition it would be almost impossible to handle fruit and put it through the various stages of grading, sizing and packing without doing some damage to the outer cover of these expanded cells and so causing decay to set in. To get rid of this moisture from the rind, the fruit is kept in the grove boxes, which are stacked in tiers around the packing house, and the air allowed to circulate freely round and through them. The rind gives up its superfluous moisture by evaporation, and becomes more tough and leathery and reduced in thickness, in which condition it will stand some pressure without bruising or bursting. The length of time required for this depends somewhat on the degree of ripeness of the orange when gathered. Early in the season, from four to five days is sufficient in a dry climate, and less if the fruit has been ripe for some time on the tree. It is to effect this curing that the grove boxes are made with open spaces between the slats in the centres and bottom corners, to give free circulation of air through the whole of the fruit in the box. If fruit is wrapped and packed fresh from the tree,



this evaporation takes place without sufficient ventilation to carry the moisture away, causing damp conditions in the box, favourable to the early decay of the fruit.

*Grading.*—When the necessary time for curing has gone by, the fruit is looked carefully over and any shewing a bruise or other injury to the rind, or unsightly indenture or mark, are culled out, and the good fruit graded by placing the perfect ones together in boxes, and those shewing a slight mark or blemish in others. The perfect specimens—that is, those without blemish, with extra bright, smooth, thin skins, and of good shape—may be packed separately and marked “choice” or “fancy,” but unless a good percentage of the whole are perfect specimens it is not advisable to separate them, but to pack the two grades together, and have the benefit of the advantage the perfect ones give to the general appearance of the whole. Any defect in an orange is much more easily detected after the fruit has been cured for a few days. Injuries become apparent which on freshly gathered fruit would escape the eye. The best of the culled fruit will usually sell for something in local and near-by markets—it is not necessarily all wasted.

*Sizing.*—The work of grading having been completed and the marketable fruit separated from the culled, the former is ready to be sized, which is done by passing the fruit through a machine which mechanically places the fruits of the various sizes into separate bins provided for the purpose. Although the foregoing treats the grading and sizing of the fruits as two separate operations, they are in actual practice accomplished at one and the same time. That is, the boxes of fruit just as they come in originally from the grove are put into the hopper on the sizer and a man experienced in the work grades them, passing the marketable fruit down the one runway of the sizer and the inferior fruit down the other. Any fruit unfit for any grade whatever is thrown into a box placed near him for the purpose, and discarded altogether. Worked in this way, it requires a very quick and experienced man at the sizer to do the work fast enough to keep the bins full and the packers not waiting for fruit to come to them to pack. If previously graded, the mere passing of the fruit down the runway of the sizer can be done rapidly by labour unfamiliar with the work of grading.



*Sizers.*—These machines are of many makes and styles, and more or less elaborate according to the quantity of fruit to be handled in a given time. The most simple, and which can hardly be designated as a machine at all, is the inclined plane divided into sections, each section being a certain degree wider than the one immediately above it. These widths are set to suit the diameter of the oranges of the regulation packs shewn under the heading “packing” (see figs. 2 and 3). This style of sizer is advisable for small quantities of fruit only; it is not sufficiently accurate unless the fruit is fairly round, as the oblong varieties are liable to stick and stop up the run-way, taking the time of the operator to clear it.

By a good sizer is meant one which will size fruit (whether round or oblong) accurately according to its diameter, and which will pass the oranges on freely, not allowing them to stick and choke up any portion of its parts. It must not damage fruit. In large up-to-date packing houses an engine provides the power to run the machinery of the house, including conveyors for moving boxes from place to place with a minimum amount of hand labour. Such houses are only used in countries where labour is expensive and the amount of fruit to be handled will warrant the expense of the equipment. There are less elaborate sizers on the market with double run-way on the roller, and endless rope system worked by hand power, which do accurate and good work. These are constantly being improved, and a personal inspection of the latest styles is necessary in making a selection.

*Boxes.*—The rules and regulations laid down by the Union Government of South Africa for the preparation of oranges for the export trade, and mentioned at the beginning of this article, require the use of the standard sized box, the inside dimensions of which are divided into two separate parts, each containing one cubic foot of space. The outside dimensions vary a little according to the thickness of the material; they are usually  $12\frac{1}{2}$  by  $12\frac{1}{2}$  by 26. The material of which they are made must be bright, clean, white wood. This material is imported in stook form, the sides usually being 6-inch slats and bundled separately from the pieces forming the heads and divisions. The boxes are strengthened by being hooped at the

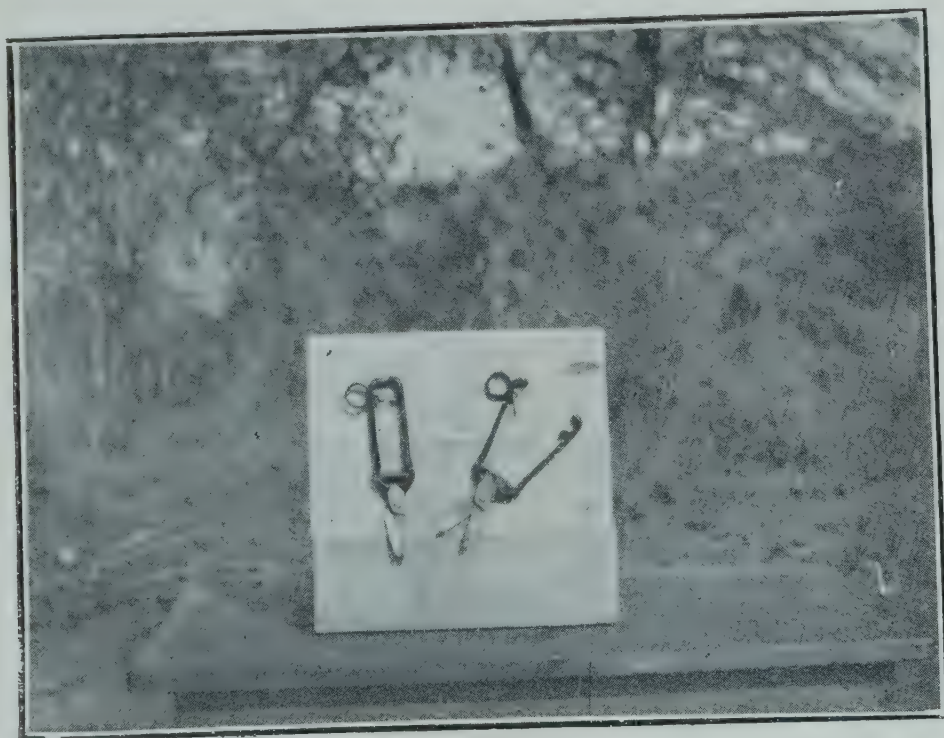


Fig. 1.—Orange clippers.



Fig. 2.—Sizer at Premier Estate, made by local carpenter.







Fig. 3.—Sizer at Premier Estate.



Fig. 4.—Box-making at B.S.A. Company's citrus farms, Mazoe.



ends and in the centre with light iron. These boxes are put together in a frame, provided for the purpose and which can be made on the farm, the hoops being put on as the box is made. A side view of the frame or box maker out of use can be seen in fig. 5.

The points of importance to be observed in making the boxes are that the frame should be made accurate and the parts square with each other, or the boxes will be crooked and the inside unevenly divided, which will result in the packed box being too tight or too loose. Also, in commencing, the three pieces forming the ends and division must be run into the frame with the grain of the wood horizontal, because the first part to be nailed on is the bottom of the box and the nails securing this should enter the heads across the grain for the sake of strength. The three hoops are laid on projecting equally over the sides and nailed on at one operation with the pieces forming the bottom, using two nails at each end and in the centre of each slat. This portion of the box is then withdrawn from the frame and put back again into it with the side uppermost. The pieces forming the side and the hoops are then nailed in the same manner. Again withdrawing and returning the box to the frame with the other side uppermost, the second side is nailed on. The ends of the hoops will now be loose at the four corners and in the centre of the box, and of such a length as to meet across it. The top will, of course, be open for packing; and the packer, before he begins, should turn down the loose ends of the hoops out of his way and to prevent fruit coming into contact with them in the process of packing.

*Packing and Appliances.—Paper.*—The paper in which oranges are wrapped should be thin, strong and contain as little oil as possible, to enable it to absorb and throw off moisture rapidly. This paper is purchased from the dealers cut into squares ready for use of the following sizes:—

For oranges running per box

|               |     |     |                 |
|---------------|-----|-----|-----------------|
| 80            | ... | ... | 14 by 14 inches |
| 96, 112       | ... | ... | 12 by 12 ,,     |
| 126, 150      | ... | ... | 11 by 11 ,,     |
| 176, 200      | ... | ... | 10 by 10 ,,     |
| 216, 226, 252 | ... | ... | 9 by 9 ,,       |



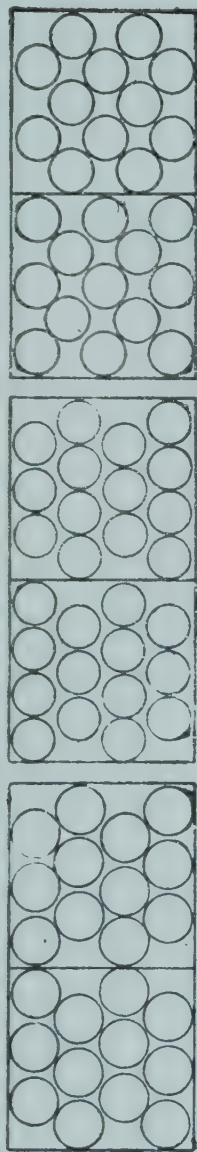
These sizes are large enough to cover the fruit and leave enough to make a twist. The wraps may be plain or stamped with a coloured design bearing the name or mark of the grower. An attractive design greatly adds to the appearance of the packed box (see fig. 5).

*Stools.*—As the fruit leaves the sizer it rolls into bins, each size finding its own bin. A movable stool of a convenient height, and with a strip an inch thick tacked on to the back to slope the box toward the packer, is placed up against a bin to allow him to reach the fruit easily. When the half of the box nearest the bin is packed, it is turned to bring the empty half near to the fruit. Stools with revolving tops are much in use to save the packer the exertion of picking up the box to turn it. When the packing of a box is finished it is set aside, and the stool moved to whatever bin the packer wishes to next pack from.

*Paper-holders.*—These are merely trays with three low sides made from a piece of board about the same size as the wraps, and are used to hold the wraps, which are protected by the low sides from being blown about by wind or strong draughts through the house. They are placed on the side of the box not being filled, and conveniently to the left hand of the packer.

*Wrapping and Placing in the Box.*—If the wraps have a design upon them they are placed in the paper-holder with the design upwards. With stool, box and paper-holder placed in position, the packer takes a wrap with the tips of the fingers of the left hand, allowing it to spread out over his palm, with the right hand he takes an orange from the bin and puts it, blossom end on, into the paper on the palm of his left hand, and with the right gives the ends a twist and places it in position in the box. The first two layers of fruit are placed in the box with the twist of the paper upward; afterwards they are placed with the twist downward. This brings the fruit in proper position in case the bottom of the box is opened by mistake in the market. The manner of placing the fruit in the box to suit the nine different packs and to exactly tightly fill the box to the proper level, which is from one-half to three-quarters of an inch above the edge of the box, is shewn in the following diagrams.

Layers 1 and 3: 12. Layers 2 and: 12. Layers 1, 3 and 5: 13. Layers 2 and 4: 12.

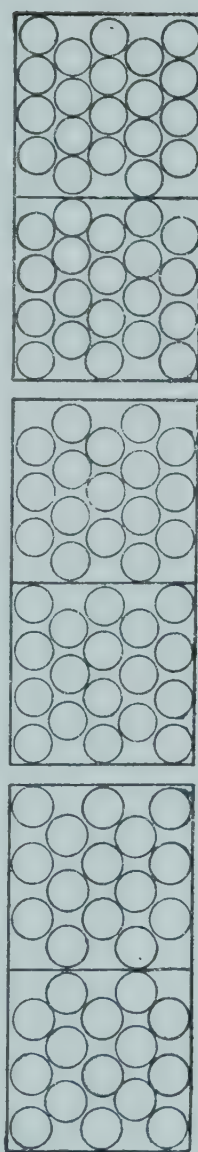


Number and size 96.

Number and size 112.

Number and size 126.

Layers 1, 3 and 5: 15. Layers 2 and 4: 15. Layer 6: 18. Layers 1, 3 and 5: 20. Layers 2 and 4: 20.

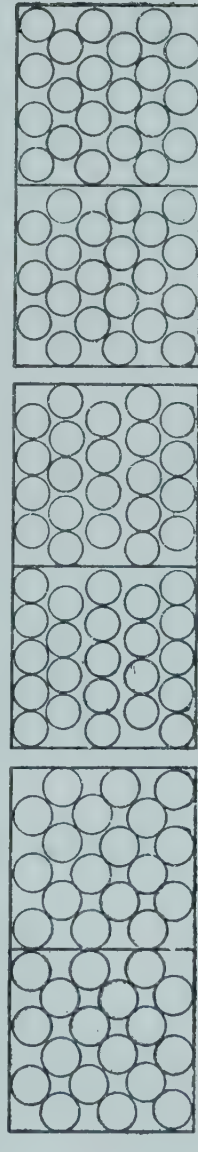


Number and size 150,

Number and size 176.

Number and size 200.

Layers 1, 3 and 5: 18. Layers 2, 4 and 6: 18. Layers 1, 3 and 5: 21. Layers 2, 4 and 6: 21.



Number and size 216.

Number and size 226.

Number and size 252

FIG. 3.—Diagrams showing the arrangement of oranges of different sizes in crates: No. 96.—Diameter,  $3\frac{3}{4}$  inches; layers, 4. No. 112.—Diameter,  $3\frac{1}{4}$  inches; layers, 4. No. 126.—Diameter,  $3\frac{1}{4}$  inches; layers, 5. No. 150.—Diameter,  $3\frac{1}{8}$  inches; layers, 5. No. 176.—Diameter,  $2\frac{11}{8}$  inches; layers, 5. No. 200.—Diameter,  $2\frac{11}{8}$  inches; layers, 5. No. 216.—Diameter,  $2\frac{1}{2}$  inches; layers, 6. No. 226.—Diameter,  $2\frac{1}{2}$  inches; layers, 5. No. 252.—Diameter,  $2\frac{7}{8}$  inches; layers, 6.

If the boxes are made and the fruit sized correctly by following these diagrams and allowing the spaces as shewn, there will be no trouble in finishing off the boxes with that smooth, even appearance which denotes the well-packed box. A little study of the diagrams will shew that the fruits never rest exactly on the top of each other, but those of one layer rest on the divisions between those of the layer below, holding each other in position and giving solidarity to the whole. Oranges seldom run less than 96 to the box, but if too large for this, the 80 pack can be resorted to. This pack is not shewn among the diagrams, but it requires four layers placed 3 and 2 in the same way as the 126 pack.

*The Press.*—It will be observed that the top layer of fruit should rise from one-half to three-quarters of an inch above the edge of the box. In order to nail on the top and to make the whole so tight that no orange can shake or move from its position under any conditions of handling while the box holds together, the packed box is placed on a stool under a press, upon which the weight of a man is gradually put while he adjusts the loose ends of the hoops and prepares to nail on the pieces forming the head (see fig. 6). This press is usually a simple home-made affair, and the one shewn answers the purpose quite well.

*Stencilling.*—When the heads have been nailed on it only remains to mark the boxes. In doing this it is necessary to conform to the method required by the rules and regulations. The number of fruits contained in the box is stencilled in the top right-hand corner of one end, with the grade (if any) to the left of it. Just below is the name of the variety of fruit, and below that again is the shipper's mark, with the name of the consignee on the top (figs. 7 and 8). It is not really necessary to mark on the grade or the shipper's mark, and the latter is not usually done unless the contents of the box are very first class. The number and variety and consignee's name are necessary.

*Packing House.*—No particular mention has been made of the house in which to pack fruit. Every grower has his own ideas of the details of such a house, and it must conform to the building materials to be had in the country where wanted. Its



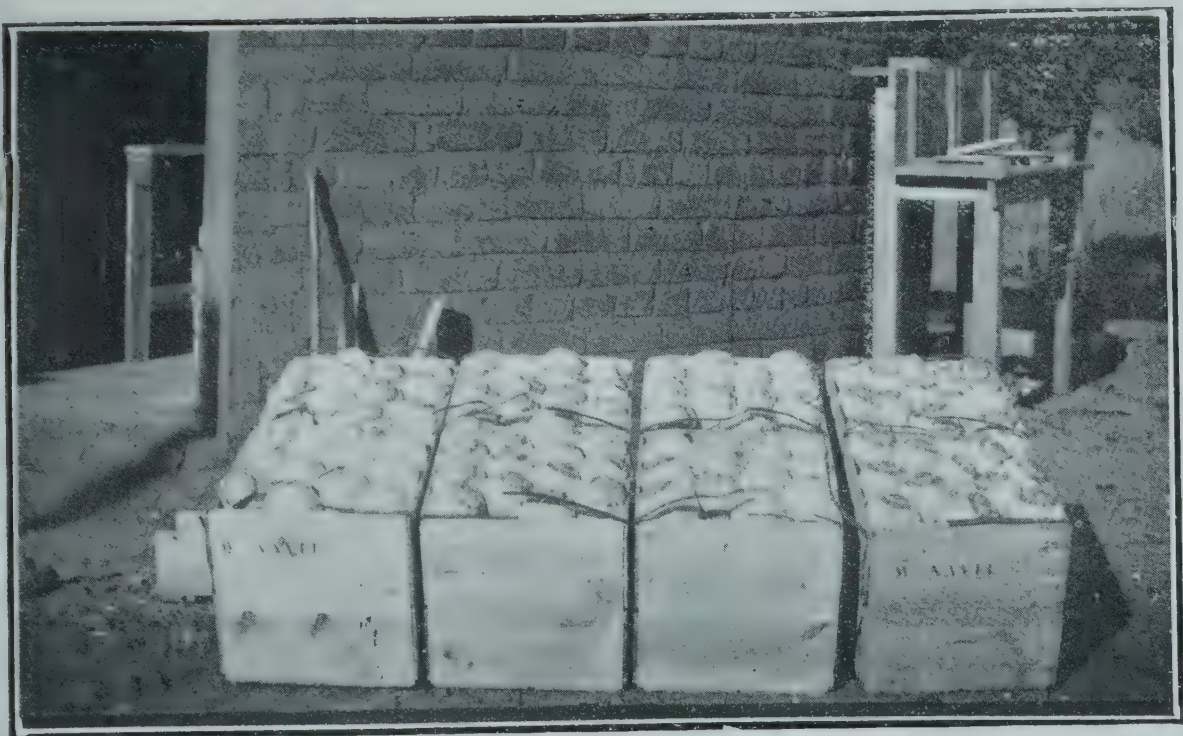


Fig. 5.—Packed fruit.

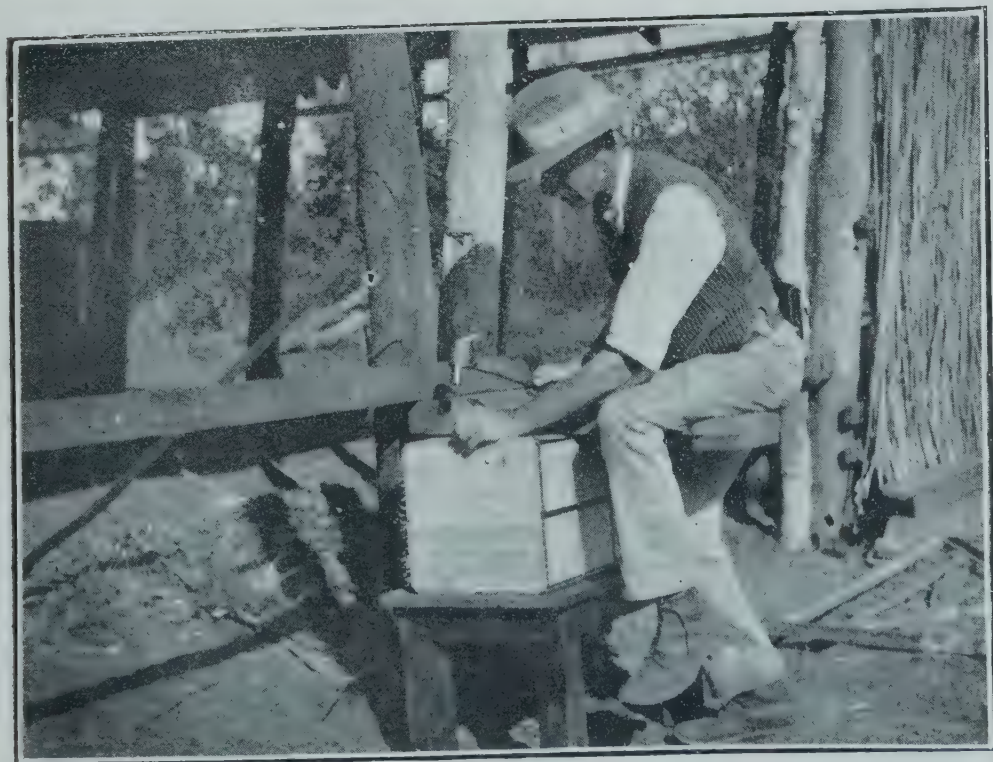


Fig. 6.—Pressing and nailing on the top.





Fig. 1—Box arranged at the end



Fig. 2—Box arranged at the top





size must be regulated by the amount of fruit it is proposed to pack in it. The important features are plenty of floor space to allow of the curing of the fruit in the house, the putting together of boxes, and the placing of the sizers and their bins, with room for the packers round them. The house should be much longer than its width, with large doors at one end, up to which the wagons bringing the fruit from the grove can draw. As the fruit passes through the sizers, and is packed and headed up, the boxes find their way by stages to the opposite side of the house, which should have large doors also, and so arranged that the boxes ready for consignment can be loaded on to wagons direct from the floor of the house and sent to the station. In this way grove boxes of loose fruit coming into the house are not interfered with by packed boxes going out. In Rhodesia a good floor, probably of cement, with an iron roof supported on brick pillars, will form the chief part of a packing house, with some arrangement to shut off wind from any direction required.

## Compulsory Dipping Ordinance.

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Various measures affecting the farming community were passed during the recent session of the Legislative Council, and not the least important of these is the Compulsory Dipping Ordinance. The desirability of legislating on these lines has for some time been realised by the Government, and that this view is also shared by the farming public is evidenced by the unanimous resolution passed at the last Congress of the Agricultural Union. The new law renders the dipping of cattle, and such other animals as may be prescribed, compulsory on the commonages of towns and villages, and enables compulsory dipping to be applied in any rural area where such is the wish of the majority.

During the passage of the Bill a number of amendments were introduced. The Ordinance, as finally adopted, gives the Administrator power, should the owners of land in any area by a majority of votes request him, to bring compulsory dipping into operation, and similarly dipping can be suspended upon a like representation. Objections to the bringing into operation or suspension of compulsory dipping have to be made within six weeks of the last publication in the *Gazette* of the notice intimating the action proposed to be taken.

An area is defined, as in the case of the Fencing Ordinance, to mean each of the several native districts or such area as the Administrator may define. The word "area," therefore, does not necessarily refer to any particular administrative unit, but gives any group of farmers power to apply for the application of the Ordinance within any region they desire.

The term "owner" includes (1) any person, company, co-partnership, or public body in actual occupation of or entitled to occupy any land; (2) persons holding land from the B.S.A. Company under permit of occupation.



In the case of non-resident owners, authorised representatives or agents will be empowered to vote for the introduction or otherwise of the provisions of the Ordinance within any given area.

Voting is to be on the basis of one vote in respect of an area of land not exceeding 1,600 morgen, and two votes for an area in excess thereof.

The Administrator, *vide* clause 4, may, within any area in which compulsory dipping has been ordered, require an owner to construct a dipping tank upon his property.

The difficulty confronting the Administration in introducing this measure has been the hardship involved in compelling poorer members of the community to build dipping tanks and the question of assisting the man who cannot afford to erect a tank. Clause 5 has been designed to meet the difficulty, and gives statutory security to persons providing loans for the purpose of erecting dipping tanks. It reads:—"Persons furnishing loans for the purpose of erecting dipping tanks may, with the consent of the owner, cause a notice in writing to be sent to the Registrar of Deeds of the amount due by such owner, and the Registrar shall make an entry thereof in respect of the land affected. Such entry shall constitute a hypothecation of the land, ranking from the date on which the entry was made and for the amount therein stated; provided that the Registrar may pass transfer of land so hypothecated if the transferee agrees in writing that any sums due and unpaid shall remain and be registered as a charge against the said land."

The B.S.A. Company has agreed on certain conditions to give the necessary assistance when such assistance cannot be obtained elsewhere and in deserving cases. No assistance will, however, be given to persons who can themselves afford to build a tank. In this connection we may quote the remarks of the Treasurer during the debate on the second reading of the Ordinance. The Treasurer said:—"A great many farmers would no doubt be able to build their own tanks. A great many people would be able to borrow money elsewhere, and to those who could not do so the Company would be prepared to give assistance under certain conditions, but it would

be clearly understood that it was not going into any wholesale scheme of relief beyond a certain amount of money."

The Administrator may, in areas where compulsory dipping is in force, provide dipping tanks for the common use—

- (1) of owners of less than 100 morgen;
- (2) of natives in native reserves.

The Administrator also has the power, at his discretion, to suspend compulsory dipping in any place for such time and to such an extent as may be deemed expedient. This is especially intended to enable the frequency of dipping to be altered as season and circumstances require and to allow some elasticity in the application of the law.

Provision is made for the inspection of dipping tanks with a view to ascertaining that dipping is being carried out and that the dip is of the required strength. This provision was not included in the Ordinance as originally drafted, but was inserted upon representation from the elected side of the House. It is a very necessary provision and will materially assist in attaining the object for which the Ordinance is designed.

The penalty for not complying with the provisions of the Ordinance, which includes refusal or neglect to carry out dipping, to erect a dipping tank, or to keep the tank in a proper state of repair, is a fine not exceeding £20, and in default of payment, to imprisonment for a period not exceeding one month.

In clause 13, power is given the Administrator to make, alter or repeal regulations for the better carrying out of the provisions of the Ordinance.

The Ordinance has so far met with a cordial reception by the farming community, and we hope to see it given effect to and rapidly applied to a number of areas. The advantages of dipping are so obvious and are being so quickly realised that we think the day is not very far distant when every man owning stock will, of his own accord, have a dipping tank on his farm.

# Concrete and Reinforced Concrete.

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By EDWARD HARDCASTLE, M.I.E.E., Consulting Industrial Engineer.

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Reinforced concrete is occupying an important position in the construction of walls, columns, beams, arches, floors, roofs, etc., and, generally speaking, it is the main material used in constructional work. Owing to its adaptability to formation and the combined use of cement mortar for rendering, all objectionable corners and angles may be rounded and all faces made dead smooth, a point which is so commendable in farm uses such as stockhouses, pens, water-tanks and dairy buildings. On the other hand, it may be formed to give artistic feeling, and almost any lasting pigment as colouring matter may be used to suit the fastidious taste of the individual. Without doubt cement for mortars and concrete work is one of the most useful materials on the farm, and should be kept in stock in a dry place for all contingencies. The great drawback to its general use is the high cost, and it is regrettable that such a useful material is so costly. The price in England is under £2 per ton, while the price in Salisbury for the same commodity is £8 8s. per ton. Still, the use of cement in reinforcement will compare favourably in cost with other materials in use for the same structure.

The farming industry of Rhodesia has attained a position of stability and permanency, and structures should likewise be permanent. There is nothing more annoying and costly to the farmer than to be continually repairing the ravages of insect life and climatic conditions—all these troubles may be obviated by judicious use of the right materials in the right place.

Concrete is one of the best known materials for fire resisting qualities and durability under all climatic conditions; it



is very strong under compression or withstanding weight, but when subject to tensile stress, that is, pulling apart, it is very weak and brittle. For this reason it is necessary to be reinforced with such a material as steel, which is very strong in tension. When concrete is reinforced with steel the ductility of the combined material is increased and becomes less brittle; higher stresses may be used, and it withstands shocks and vibrations to a much greater extent. Providing that concrete is properly made, and the position of the steel is correctly embedded, we get a very strong and elastic structure which is fireproof, rotproof, waterproof and rustproof; at the same time its strength increases with age.

Concrete can be made impervious to water if the aggregates are properly mixed and the structure made close and homogeneous or compact, while assistance may be obtained by the use of ingredients such as lime, "Medusa" or "Pudlo," if a very small quantity is mixed with the cement and sand in the rendering or finishing coat.

It is of the utmost importance in reinforced work that the steel should be placed in the correct position in the concrete: whatever the metal may be, it is, generally speaking, used for the tensile stress. Articles have been written and illustrated for publication where metal has been inserted in concrete walls for no other purpose than for reinforcement, but it was rendered useless owing to its being placed in the wrong position.

To render concrete more waterproof it is continually suggested that a wash or coating of certain soaps, oils or waxes may be used, but, personally, I deprecate the custom, as I have seen concrete ruined after years of use by the application of these materials.

Another great point in all concrete work is to obtain a good reliable cement. It is impossible within the scope of this article to explain away the reason for every "don't," but I think a slight digression in this instance will be useful.

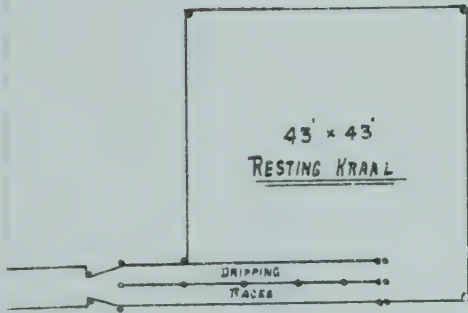
Portland cement is of artificial origin, and is made from the ingredients which principally constitute lime, silica and

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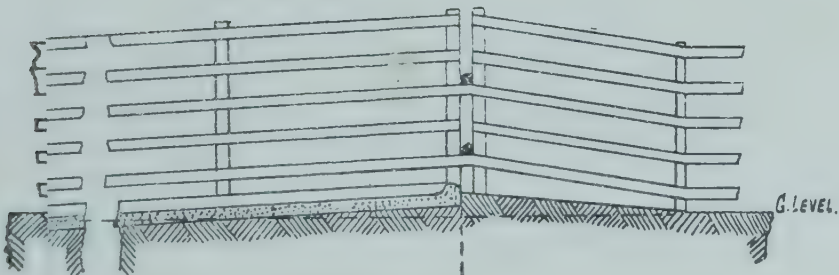
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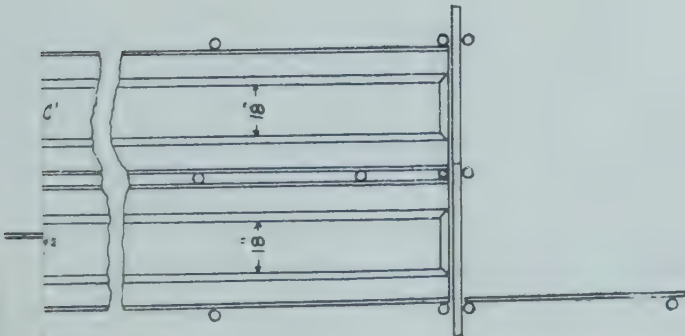
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Portland cement is of artificial origin, and is made from the ingredients which principally constitute lime, silica and



alumina, mixed, burnt and ground in definite proportions by the most careful and scientific methods, and carefully tested during its manufacture to procure a uniform chemical composition. It should be known as "artificial Portland cement." There is a natural cement which is also called Portland cement, and even sold as "best Portland cement," which is obtained in large mineral deposits, and it is well known that in such deposits the ingredients vary considerably. These materials are dumped into the kilns and burnt irrespective of their constitution, and ultimately passed off to the public under the above title. This class of cement should be termed "natural cement," as a contradistinction, and it is very much inferior to the "artificial." I have had occasion to inspect structures which have failed, and the failure has been entirely due to this inferior material.

I think it is generally believed that concrete can be and is made by unskilled labour and casual supervision, but I can give the assurance that this is not the case. Many failures in this class of work have taken place through want of knowledge and proper supervision, and it would have been much better to have taken skilled advice in the first instance. Concrete work may materially alter according to the conditions of the ground upon which the work is intended to be constructed, especially in the case of foundations to underground tanks and heavy columnar structures.

Irrespective of my statement in the article "The Preparation and Use of Concrete" in the April *Journal*, it is necessary to state that concrete for reinforcement, and particularly for such purposes as water tanks, differs somewhat from the concrete used for foundations and the like. Although homogeneity is necessary in all concrete work to obtain the maximum strength, it is more so required for reinforcement and in concrete used for waterwork. In the first place, a thorough bond must be obtained between the concrete and steel, otherwise the strength of the steel will not be fully utilised; also, unless the concrete is homogeneous and compact it will not be impervious to water, and trouble will arise at some future date. Therefore more judgment is required in its use in this class of work.

The ingredients must be of good quality, thoroughly mixed and properly proportioned, the mixture to be fairly wet and panned in its position so as to reduce the voids to a minimum. The stone and sand used for the aggregate to be non-porous, and neither of these to be used which has a deleterious effect upon the steel. That the steel reinforcement may be completely surrounded with the concrete, the stones should be broken sufficiently small to pass all ways through a  $\frac{3}{4}$ -inch ring. The steelwork should be cleaned from grease and paint, otherwise the cement will not adhere to the metal. The thick rust should be cleaned away before putting the steel into position, and the steel reinforcement must be well supported during the construction, otherwise there will be displacement.

In submitting these articles on the use of concrete and reinforcement, more detail will be given with illustrations for the construction of work of interest to farmers. In this issue I purpose to deal with the construction and comparative cost of a reinforced concrete cattle dipping tank.

The accompanying drawings will shew the general construction of the reinforced concrete dipping tank sufficiently clear to enable anyone to construct a tank therefrom. There is practically no difference between this and the ordinary tanks, excepting for the use of reinforcement, the additional sump, and the double draining race; the general utility of these points must be quite obvious to all.

In comparing the costs of constructional work of this description, it is best to bring the whole similar to one another, and in this case I will simply give the comparison of the tank only, and give the additional cost of the extras separately. The comparative tank will be the one described in Bulletin No. 167.

The cost of material and labour will essentially vary in different districts of Rhodesia; therefore I will take the costs as if they were constructed by contract in Salisbury. The ratio of comparative prices of materials will be the same wherever the tanks may be put down, and therefore the ratio of saving in cost will approximately be the same. The internal dimensions of the reinforced tank is of the same size as

that shewn in Bulletin No. 167. The timber work I have left out of the calculation, because this is generally obtained on the farm, and has nothing to do with the tank proper. The extra cost of the concrete and rendering is given separately:—

Cost of the ordinary concrete tank:—

|  |        | £   | s. | d. |
|--|--------|-----|----|----|
| 36 cub. yards of concrete ...              | @ 70/- | 126 | 0  | 0  |
| $\frac{1}{2}$ coil of barbed wire ... ..   | @ 18/- | 0   | 9  | 0  |
| 98 sup. yards of rendering ...             | @ 10/- | 49  | 0  | 0  |
| 9 sup. yards of 9-in. walling ...          | @ 5/-  | 2   | 5  | 0  |
| Excavations the same in both cases (about) |        |     |    |    |

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Total ... .. £177 14 0

Cost of the reinforced concrete tank:—

|                                 |        | £  | s. | d. |
|---------------------------------|--------|----|----|----|
| 13 cub. yards of concrete ...   | @ 70/- | 45 | 10 | 0  |
| 123 sup. yards of reinforcement | @ 4/-  | 24 | 12 | 0  |
| 133 sup. yards of rendering ... | @ 10/- | 66 | 10 | 0  |
| Excavations about the same      |        |    |    |    |

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Total ... .. £136 12 0

Extra for one draining race and sump:—

|                                  |        | £ | s. | d. |
|----------------------------------|--------|---|----|----|
| 2 cub. yards of concrete ... ..  | @ 70/- | 7 | 0  | 0  |
| 9 sup. yards of rendering ... .. | @ 10/- | 4 | 10 | 0  |

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Total ... .. £11 10 0

From the above it will be seen that there is an approximate saving of £41 by using reinforced concrete. This figure may vary a few pounds either way according to the conditions and the position where the tank may be fixed.

LAYING OUT THE SITE AND EXCAVATIONS.—Much has been said about the suitability of the site for concrete dipping tanks, and care should be exercised in its selection. Generally speaking, it is as well to keep away from clayey soils if possible, owing to the great changes in



contraction during the dry season. But if good workmanship and materials are used there is little to fear for the stability of the structure.

In setting out the site, it is always advisable to clear away all the irregularities of the surface and get the whole fairly level, removing all the surplus earth from the clearing and excavations to some little distance, so as not to interfere with the general work.

To mark off the site carefully, begin with putting down a flexible wire along the centre line of the tank: draw it very taut, and securely fix it on two strong pegs about 98 feet apart. Measure off the widths and lengths of the tank excavations to the various points where the concrete finishes at the ground level, and be careful not to get the sizes too large, otherwise more concrete will be used than is necessary. At the same time, I very much deprecate filling in and ramming tight any discrepancy in the excavations. This process always disturbs and at the same time causes cracks in the concrete when partially set, and when once cracks appear in this manner they can never be made quite so good as the sound concrete. The excavations should always in the first instance be made slightly under the full size, and trimmed off later with a mattock or a strong handled hoe; this operation enables one to get a nice smooth hard bed for the concrete to rest upon. It is as well to get a light triangular templet the same shape and size as the pit excavation, and after the bulk of the earth has been removed trim away the surfaces neatly to the templet, keeping it always perpendicular on its vertical centre line. A band fixed on the centre of the top scantling of the frame and of sufficient length to reach the centre of the bottom scantling of the templet will act as a plumb bob to keep it vertical. After the deep portion of the tank has been finished off, the templet may be shortened at the bottom occasionally and used to get the correct shape of the excavation of the sides over the exit incline. Do not alter the angle of the sides of the templet.

When the whole of the excavation is finished, ram all the surfaces thoroughly with an iron rammer: this will give a clean, hard and compact surface and at the same time lessen

the risk of earth falling into the pit when the concrete is being filled in.

**LAYING DOWN THE CONCRETE AND REINFORCEMENT.**—It is assumed that all the materials for the concrete and reinforcement are delivered on the site before the excavations are started, and the skeleton of the reinforcement made whilst the excavations are in progress, so that a start may be made with the erection immediately the excavations are completed. It is unnecessary here to give any further particulars respecting the class of materials, and the precautions necessary for the making of good concrete, as this has been dealt with in the article "Preparation and Use of Concrete" published in last April's *Journal*, except that in the use of concrete for reinforced work of this description all the stones should be broken to pass through a  $\frac{3}{4}$ -inch mesh screen, and the proportions of the materials should be one part of Portland cement, two parts of clean washed sand and four parts of broken stones of the above size.

As suggested, it is advisable to erect the skeleton of the reinforcement on the embankment to the shape of the complete tank as shewn, fasten temporarily with a binding here and there at the joints, brace together with small timber from the farm, and make the whole rigid during the temporary erection. If this is done, there will be less trouble in cutting and getting into shape, and no time will be lost when one has to direct all his energies to the filling of the concrete.

There are many types of reinforcement employed with concrete, but the type I consider to be the most efficient and least trouble for this purpose is known as "expanded metal," and is made in various sizes in width, length and strength. No. 8 being suitable for a tank of this size. To commence, it is best to take a sheet of the metal and bend it in two places near the middle of the sheet, to form a cradle the same shape as the bottom of the tank as shewn on the drawing at the figure "section on C.D." The cradle will have a base of 2ft. 6in. between the sides and the ends extending upwards whatever they will; thus if the sheets are 7ft. long the sides will extend 2ft. 3in. upwards.



Next bend another in the like manner, and, when putting together, let one cradle overlap the first cradle at the side for a distance of one mesh and bind together temporarily; proceed further until the deep portion of the tank is completed as far as the incline shewn on the drawing at the longitudinal section.

I may mention here that some engineers give expanded metal two laps without any binding, but I have been more satisfied with the single lap bound thoroughly with a good wire. There will be a little difficulty in getting the metal into shape for the incline reinforcement, but with a little ingenuity the difficulties will disappear. There will be no difficulty with the side and ends. The ends will have to be bent and bound in a manner similar to the cradles.

When the sides have been bent slightly to the curve immediately behind the splash ledge shewn on figure "section on C.D." it is required to secure a long strip of metal to reinforce the splash ledge.

When the skeleton reinforcement is completed, commence to lay the concrete on the bottom of the tank in a layer of two inches thick for a portion of about one yard at a time; then put down the cradle of the reinforcement into position, together with the end portion, lacing together similar to the binding of the barbed wire to the standards of fencing. After completing the binding fill in another layer of concrete  $3\frac{1}{4}$  inches thick, which will make a total of  $5\frac{1}{4}$  inches in thickness; the remaining thickness of  $\frac{3}{4}$  inch will be the thickness of the rendering which will have to be done after all the concrete is completed.

Repeat this operation until the whole of the base and a portion of the incline is complete, then deal with the sides. The projecting portion of the sides will have to be filled in, but at this point it is necessary to fix the boarding or shuttering, which consists of 9in. by  $1\frac{1}{2}$ in. timbers, to the shape of the tank, always allowing for the  $\frac{3}{4}$  inch of rendering, and well brace from each side to support the concrete. Before commencing to fill in the sides, see that the expanded metal will come up the face of the boarding to  $1\frac{1}{2}$ in. from the boards, so that all the metal will be covered with that thick-



ness of concrete on the inside of the tank and before the rendering is applied.

When this is completed, fix the upper sheets of metal in position, binding all the joints and overlapping as described. The punning of the concrete should be done with bars of iron about  $1\frac{1}{4}$  inches in diameter and  $2\frac{1}{2}$  feet long, and the concrete brought into close contact with the ribs of the metal. This process can very well be done through the mesh, which is about 3 inches square, and the work must be done lightly but thoroughly. I do not advocate the removal of the boarding under two days and nights at least; if removed earlier, there is too much risk of fracturing the concrete. The surface of the concrete must be kept wet and protected from dirt; this is essential for good work.

**PLASTERING OR RENDERING THE CONCRETE.**—The surface of the concrete should not be too smooth for plasterwork, and if found in this condition on the removal of the boarding, the smooth surface must be scored with a trowel while the concrete is damp. The walls should be thoroughly wetted before applying the plaster.

To make the plasterwork of the tank straight and level, it is usual to form "screeds" at the top and bottom of the walls. Screeds are bands of cement, and sometimes wood, usually the correct thickness of the plaster, upon which is run a straight edge. The straight edge is used to scrape away the surplus plaster and to give a dead straight surface. The screeds, when set, in the case of cement are filled in between with the cement plaster and the surplus scraped away as mentioned. The plaster is then surfaced with a double handled hawk, afterwards done over with a float; when using the float a circular motion must be given to the tool. This operation will give a rough sandy look to the surface, and later on, when the cement is partially set, a metal trowel must be used to give the whole a dead smooth finish. The cement plaster should never be worked with the metal trowel while it is in a very damp condition, otherwise the finer cement will be brought to the surface, at the same time forming a very rich coating, which on drying out will give innumerable hair cracks.

A good working mixture for cement plastering is made of two parts of Portland cement, eight parts of well washed sand and one part of putty lime. This mixture hardens rapidly and is of great strength; it is also impermeable to water and at the same time it will give a whiter appearance than if sand and cement alone are used.

The method of preparation is to mix the sand and cement in the dry state, afterwards adding putty milk and mixing to the proper consistency, always keeping it well stirred with a trowel while it is in use.

Putty milk is made as follows:—The quick lime from the kiln is slaked with a sufficiency of water, and left over for a few days, when it will fall into a powder. This powder is then sifted through a mosquito netting sieve into a tub of water and stirred up well. It is afterwards allowed to settle, and the putty lime falling to the bottom of the tub, the water is drawn off and is called lime water. After a few days more the putty lime is mixed with water to the consistency of stiff cream, and mixed with the sand and cement—this thick creamy lime is known as putty milk. It is as well to mention here that whenever new concrete is applied to old work the joining must be thoroughly cleaned and sometimes chipped to make a clean rough surface. This surface should be brushed with cement grout and the concrete immediately added. Where concrete is only a matter of a few hours old, the application of the grout is quite sufficient.

The cement grout is usually made of one part of cement and one part well washed sand, and mixed to the consistency of cream with water, and applied immediately, otherwise it will get too stiff.

The sides of the tank which are exposed above the surface should be banked up with the surplus soil and sloped off about 3 to 1.

# The Ground-Nut or Monkey-Nut.

(*ARACHIS HYPOGÆA.*)

By H. GODFREY MUNDY, F.L.S., Government Agriculturist  
and Botanist.

During the last four years the ground-nut, which previous to that time had been regarded almost entirely as a native crop, has made rapid advance in popularity as a staple Rhodesian crop. It is now grown more or less largely on numerous farms in Mashonaland and also on not a few in Matabeleland. This change of opinion has been brought about to a great extent by the introduction by the Department of Agriculture of improved varieties of superior cropping power to and more easy to handle than the "kafir" variety previously grown. With a local oil mill in operation, an assured market should be available for large quantities of this product, which is one of the most important oil-producing seeds of commerce. As indicative of the extent to which this is the case, the following figures taken from the Indian Trade Journal of 5th February, 1914, and relative to the Marseilles trade in ground-nuts, may be cited. In explanation of the significance of these figures, it may be stated that Marseilles is the most important vegetable oil-milling centre of the world.

In the year 1902 there were imported into Marseilles 171,788 metric tons of ground-nuts, while in 1912 the imports, expressed as unshelled nuts, totalled 359,296 tons; in other words, in one decade the imports of this commodity had been more than doubled. At the time of writing ground-nuts represent 60 per cent. of all the oil seeds annually crushed in the Marseilles oil mills. The average oil content is given at 30 to



40 per cent.; and in May, 1913, the quotations were, for unshelled nuts, approximately £11 to £12 10s. per short ton (2,000 lbs.), and for shelled nuts £14 to £15 per ton, or even more for the very choice grades. With unshelled nuts about 25 per cent. of the weight is represented by shells, so that when exporting shelled nuts a saving can be effected both in freight charges and in bags.

It is not to be expected that the Rhodesian ground-nut crop will equal the maize crop in magnitude, but it may nevertheless become one of the more important rotation crops, and one having the advantage that it can be grown on a large scale, and can be disposed of in almost unlimited quantities either locally or in Europe.

DESCRIPTION AND HISTORY.—The ground-nut is known by many common *aliases*, such as pea-nut, monkey-nut, earth-nut, ground-pea, pistache-de-terre, Arachide, goober and pindar, of which the two first-named, together with ground-nut, are the most common, though strictly speaking the term “ground-pea” is more descriptive. Botanically known as *Arachis hypogæa*, this plant is, according to most modern writers, a native of Brazil. It belongs to a genus having six other species, all indigenous to that country, and, although never reported as being met with in a wild state, it is probable that *Arachis hypogæa* may also be regarded as indigenous to South America. Ground-nuts have so long been cultivated by the natives of South Africa that they are often erroneously regarded as indigenous, especially since the nuts form so popular an article of diet amongst Central and South African tribes. From a practical point of view it is of little importance whether the plant originates in Africa or South America, but, as previously stated, the balance of opinion is in favour of Brazilian origin, and its introduction into tropical Africa is ascribed to the influence of the Portuguese as a source of food for slaves, on their transit from Africa to America.

BOTANICAL DESCRIPTION.—The ground-nut is botanically described as a diffuse herbaceous annual with upright trailing, straggly branches, rarely if ever exceeding 1 to 1½ ft. in height. Stems are thick, angular, more or less hairy and pale

green in colour, the branches spreading, leaves trifoliate with small yellowish flowers borne in the axils, and having the peculiar habit of maturing its fruit beneath the ground. In this respect it resembles the ground bean or Bambarra ground-nut (*Fasoulia subterranea*), also a crop much cultivated by the natives of tropical and sub-tropical Africa, with which it must not be confused. The blossom forms at the end of a pedicel-like calyx tube, at the base of which is the ovary. After the flower has "set" the peduncle or "spike," i.e., flower stalk, elongates, and, bending downwards, pushes itself beneath the surface of the soil, where the young seed pod matures and ripens. It may be here mentioned that should the "flower" after setting be unable to thrust itself beneath the soil, it will wither up and thus form no seed. The seed envelope or pod is of a papery character lined with net work and takes its colour largely from that of the soil in which it is grown. The pods are often slightly curved and restricted in the middle, and contain from one to three or four seeds of varying size and shape. The seed is covered by a thin skin (*testa*) ranging in colour from pale yellowish brown to bright red.

The plant belongs to the great order of the *Leguminosae*, and, in common with other leguminous plants, has the power of absorbing free nitrogen from the air and storing it in the roots. On the roots of all ground-nut plants grown in Rhodesia, large numbers of warts or nitro-bacteria nodules will be found, and within these are myriads of microscopic nitrogen-gathering bacteria. The symbiotic relationship of nitro-bacteria to the *Leguminosae* is fairly well understood, and it is only necessary to add that actual experience has amply proved that the ground-nut carries a far greater number of root nodules than any other leguminous crop grown in the country, and that in consequence as a leguminous rotation crop it ranks second to none.

VARIETIES.—Ground-nuts may be divided into two types, the one where the vines are more or less erect, being termed bunch or bush varieties, while those with prostrate or semi-prostrate stems are designated by the term "runner." The Spanish and Virginia Bush are examples of the bush type, while the local or hair variety is usually a runner. The

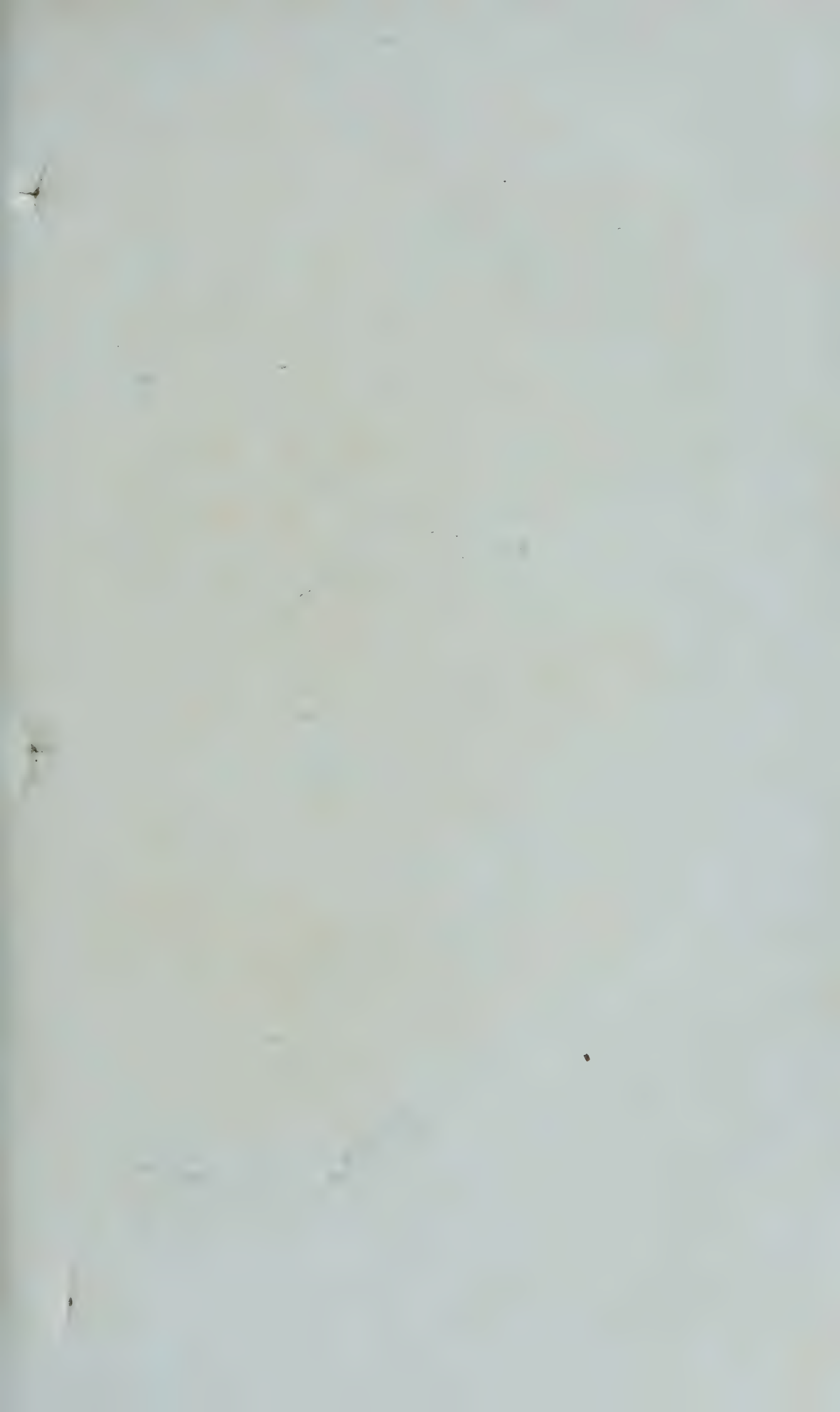


Virginia Runner, as its name implies, is also of the prostrate habit of growth, though producing a very much larger nut. In all countries where ground-nuts are grown local names for certain varieties have been adopted, such as Malay White and Malay Brown, Georgia Red and Tennessee Red. Many of these are probably very similar, and up to the present those which have been most carefully tested in Rhodesia are the Spanish, Virginia Bunch, Virginia Runner, North Carolina, Tennessee Red, Mauritius, and, of course, the local kafir variety. The Virginia Mammoth has also been grown, but this only appears to be a mixture of Virginia Bunch and Runner. Of these, the Mauritius does not appear well suited to our conditions, but the others have in almost all respects proved superior to the local kind, and have the further advantage of maturing earlier, and of producing larger, well filled, nice coloured nuts eminently calculated to meet with favour on the European market. In bunch varieties the nuts are borne in dense clusters around the main stem, whereas the running types may bear pods almost over the entire length of the vines. It will be readily understood that with the former harvesting is less laborious than with the latter. The Virginia Bunch is claimed to have a further advantage in that the peduncles are tough, and the nuts in harvesting do not readily break away from the stem.

The difference in appearance between bunch and runner types is exemplified in the accompanying illustrations of the growing plants, and the same may be said of those illustrating the respective size and conformation of the nuts. The Spanish, Virginia Bunch, North Carolina and Tennessee Red at maturity reach a height of 9 to 12 in. above ground level, and therefore yield a considerable amount of forage in addition to the nuts, while the runner varieties do not usually exceed 3 to 5 in. in height.

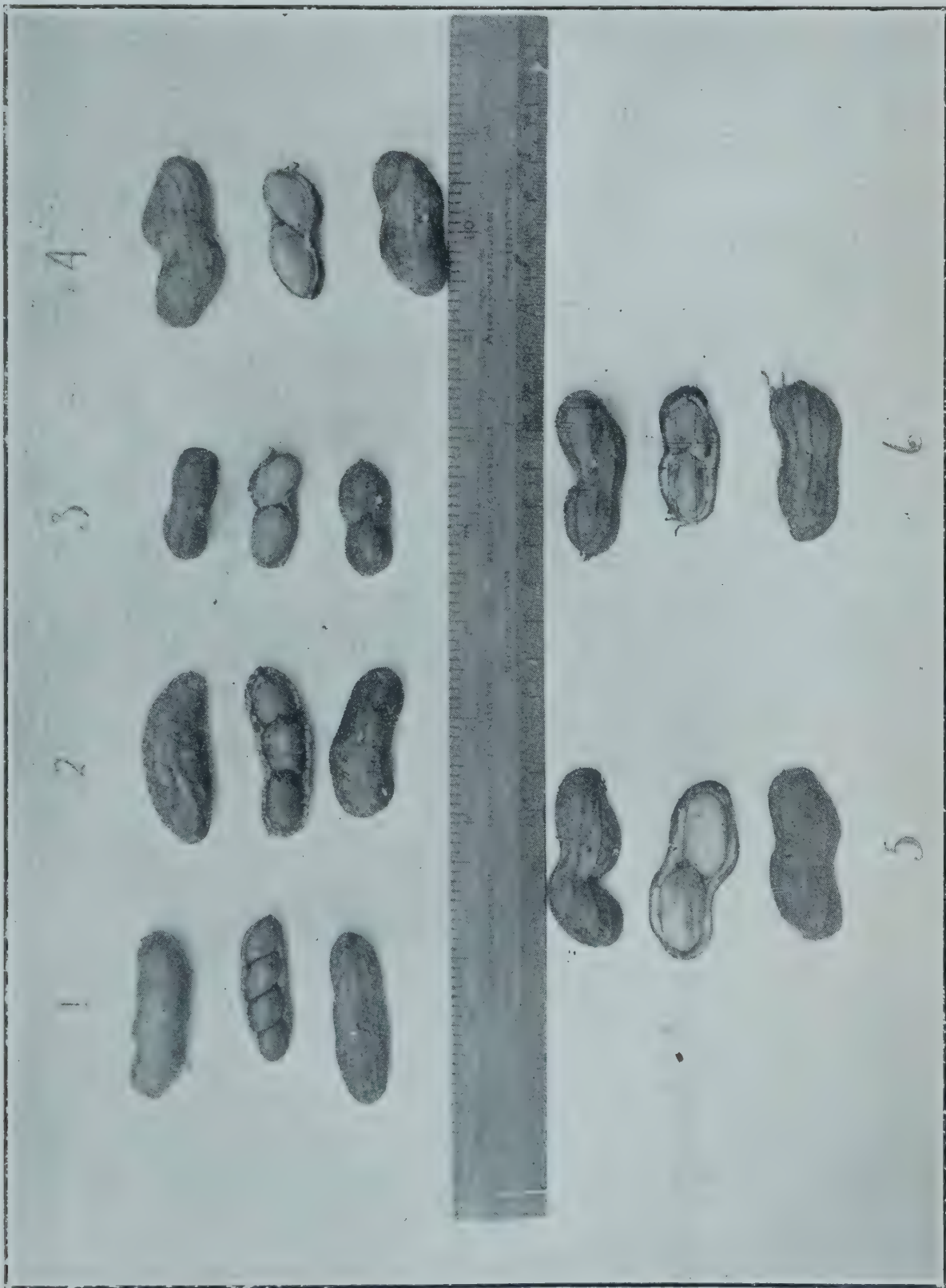
The Spanish variety usually contains three to four moderate sized nuts in each pod, the outer skin of the nuts being a bright red. The Tennessee Red is very similar in appearance, but generally only has two to three nuts to each pod, and the skin is of a rather darker red than that of the Spanish. The North Carolina has a smaller pod, containing as a rule only two kernels of a yellowish brown colour. The







Shewing the different manner in which the nuts are carried on the bunch and runner varieties respectively.  
On left, Virginia Bunch ; on right, Virginia Runner.



Ground-nuts.—(1) Spanish; (2) Tennessee Red; (3) North Carolina; (4) Unnamed, ex Mr. F. Eyles;  
(5) Virginia Runner; (6) Virginia Bunch.





Virginia Bunch and Runner both produce much larger pods, containing as a rule only two very large nuts of a pale pink or brown colour. These varieties can, therefore, readily be distinguished by their habit of growth and the appearance of the nuts. The Spanish is the quickest maturing variety and the Virginia Bunch and Runner the latest.

The following analyses of the oil content of three varieties of nuts grown in 1914 have been made by the Government Agricultural Chemist.

*Oil Content of Moisture-free Nuts (Kernels only).*

|                |        |                 |
|----------------|--------|-----------------|
| Spanish Bunch  | ... .. | 50.05 per cent. |
| Tennessee Red  | ... .. | 49.27 per cent. |
| North Carolina | ... .. | 49.98 per cent. |

The oil content of air-dried nuts would be about 2 per cent. lower than the above figures, while the average oil content of air-dried ground-nuts produced in other parts of the world varies from 42 to 51 per cent.

CLIMATE.—The ground-nut requires a moderate though not an excessively warm climate, and a growing period of six to seven months, during which freedom from frosts is absolutely necessary. As a general rule it may be said that ground-nuts can be grown wherever the climate is suitable for late varieties of maize, but with greater certainty where citrus fruits can be grown successfully. The crop seldom suffers from drought, and excellent returns have been obtained in all parts of Southern Rhodesia except where, through inexperience or necessity, seeding has been delayed too late.

SOIL.—The most favourable soils are those of a light, well-drained loamy character. The presence of a fair percentage of lime is desirable, but in this country it does not appear absolutely necessary. Good crops are often reported from land lacking in this plant food. Heavy, water-logged or clayey soils are to be avoided, as on such the cost of cultivation and harvesting is greater, while there is a liability of a large percentage of the nuts rotting. Moreover, such soils are, when properly worked, of good fertility, and can generally be used to better purpose for other crops. As far as Southern

Rhodesia is concerned, the ground-nut is essentially a crop for light red loam and sandy soils, since the plant, being a leguminous one, is able to draw upon the atmosphere for a large part of the nitrogen which it requires, and by so doing not only assists its own growth, but also tends to enrich the land on which it is grown. Such sandy soils respond very readily to light dressings of manure or fertiliser, and it seems not unlikely that were ground-nuts grown in rotation with other crops, to which manure was applied about every third year, fertility could be maintained if not increased. Where it is wished to apply fertilisers direct to the crop, the formula adopted by the North Carolina Department of Agriculture may prove a useful guide. This fertiliser analyses 7 to 8 per cent. available phosphoric acid, 4 per cent. potash and 1 to 2 per cent. nitrogen, the latter plant food not being required in large quantities owing to the crop being a leguminous one.

**PREPARATION OF SOIL.**—Sandy soils are notoriously easy to work, and beyond ploughing the land and working it to a really good tilth, no special preparation is required. Specially deep ploughing is not essential, seven to nine inches usually being found ample. The two most important points for attention are—(1) the ground must be thoroughly clean and free from weeds, since during the later time the crop is in the ground cultivation is undesirable; (2) the surface soil should be well worked and kept loose, otherwise the flower stalks, after the flowers drop, are unable to enter the soil and so to mature seed.

**SELECTION OF SEED AND SOWING.**—With this crop careful selection of seed is most important and greatly influences the resulting yield. Large well-filled pods (containing two to three seeds) should be chosen, and these should be thoroughly dry and free from mould. Where the Virginia Bunch variety is grown there occasionally appears a tendency to revert to "runners," probably due to hybridisation, in which case selection of seed only from plants true to the type desired is necessary.

Date of seeding is important. It should not on any account be delayed later than Christmas, and planting from the middle of November to the middle of December usually gives the best results.



There are three methods of sowing:—(1) whole unbroken pods, (2) cracked pods, (3) shelled seed. In the latter case care must be taken that the thin papery skin covering the seed is not broken. In South Africa the first method does not usually prove satisfactory, probably owing to lack of sufficient moisture to soften and decompose the shell.

The best results are obtained when shelled seed is used, given favourable conditions at the time of sowing, and indeed shelled seed is usually essential when planting with a machine, though so far machinery has been very little used in South Africa for dealing with this crop, and hand labour has usually been resorted to. Distance of planting depends upon the variety grown. For running kinds the rows may be about 3 ft. apart, the plants 15 to 20 ins. distant in the rows; while for those of the bunch type rows 30 to 33 ins. apart and plants 12 to 18 ins. distant in the rows appears sufficient on most soils. No hard and fast rule can, however, be given, as the fertility of the soil must necessarily be an influencing factor.

Since the spacing of the crop varies, and also the number of nuts contained in a pod, the amount of seed required will do so also. As a general rule not more than 35 to 50 lbs. of unshelled seed need be provided per acre. Two seeds are frequently dropped to each hill, or where cracked pods are used, the two halves of the pod.

Where it is decided to plant the crop on the ridge, these will be laid out in the same manner as for potatoes. After throwing up the ridges the tops are knocked down with a harrow or weeder so that at the time of seeding they are not more than 2 to 3 ins. high. Seed should be planted about  $1\frac{1}{2}$  to 2 ins. deep.

SUBSEQUENT CULTIVATION.—The object of this, as before-indicated, is two-fold:—First, to keep down weeds which, if allowed to establish themselves, rapidly outgrow the crop in its early stages, and so overshadow it that the yield is materially lessened; secondly, to retain the surface soil in loose and open condition. Cultivation by means of a horse hoe is customary, but in the early stages of growth the ordinary weeder can frequently be used with advantage. Cultivation

must cease as soon as it is seen that the flowers are being knocked off or the young pods uprooted. Opinion is divided as regards planting on the flat *versus* planting on the ridge. With the latter method harvesting by machinery is probably made easier, but experiments seem to indicate that this process does not materially affect the yield. The important point to be remembered is that the soil around the plants should be kept loose and open, and that as the flowers appear a light covering of soil to press the branches towards the ground is desirable. This end can be achieved if the last two cultivations are made with a wing shovel plough or an ordinary horse hoe fitted with a ridging attachment. On land inclined to be wet during the rainy season, planting on the ridge is always to be recommended.

**HARVESTING.**—As already stated, the ground-nut requires about six to seven months to thoroughly ripen the seed, and it is important that harvesting should commence before the advent of frosts. If this is neglected the quality of the nuts is often impaired, and the yield of haulm or vine will be greatly lessened, owing to the fact that the leaves and stems become brittle and break off during the process of reaping. The crop does not ripen very evenly, and if left too long a certain proportion of the earlier maturing nuts may sprout. Experience must be the main guide, but in normal seasons a yellowing of the vines will indicate that the time to commence harvesting is near. Harvesting by hand is a laborious and costly process, and it is largely on this account that the cultivation of the crop in South Africa has not become more general. The usual process is to send boys along the rows loosening the plants, and, after shaking the adhering soil from the roots, throwing them into heaps or windrows, where they are allowed to dry. Instead of loosening by hand, a small single-furrow turning plough can be used, and when small areas only are under cultivation, this is probably the cheapest method. For large areas a ground-nut digger is to be recommended.

In the United States and other countries where rain may be expected after reaping, precautions are taken to keep the heaps dry, but in most parts of South Africa dry weather for





Spanish Bunch ground-nuts, Botanical Experiment Station, Salisbury,  
1913-14



Tennessee Red (bunch) ground-nuts, Botanical Experiment Station,  
1913-14.





harvesting can be relied upon, and such precautions are not necessary. It is advisable, however, to plant upright poles at intervals through the field, and at the base of these to place a layer of thorn or brushwood. After the nuts have remained in the windrows for a few days they are collected and piled on the brushwood platform around these poles, and, if not in danger from white ants or field mice, they can remain there and be threshed at leisure.

Under present conditions, threshing usually consists of hand-picking the nuts from the vines, but a local grower has recently reported good results and much time saved by striking the nuts across a horizontal pole, the haulms being bunched up and held in the hand. Unless thoroughly dry when threshed, there is some danger of the nuts heating, so that care must be exercised in this respect. After threshing, the nuts can either be bagged or shelled by hand or machinery and marketed as shelled nuts. If thoroughly dry when bagged, and if stored in a dry place, they can be kept for many months without injury. The presence of unripe nuts in a sample is a frequent cause of heating, and this, especially in export, must be most carefully avoided.

YIELD.—Returns per acre necessarily vary according to the treatment the crop receives, the climate and the variety. In Rhodesia under normal conditions, yields of 15 to 20 bags per acre of unshelled nuts (a bag weighing 80 lbs. approximately) may be regarded as an average crop. The heaviest authentic yield—37 bags per acre—known to the writer was that obtained in 1913 from the Spanish variety grown on unmanured red loam at the Botanical Experiment Station, Salisbury, while in 1914 a grower near Untali reported almost an identical yield with the same variety, when grown in rotation with tobacco which was manured the previous season. Another grower in the Marandellas district has reaped  $16\frac{1}{2}$  bags of North Carolina nuts per acre, and one near Odzi 16 bags of Virginia Bunch per acre. The following table shews the relative yields of unshelled nuts from different varieties under trial at the Botanical Station, Salisbury, during the last three years:—

*Comparative Table of Ground-Nut Yields, 1912-14.*

Returns given in Pounds of Unshelled Nuts per acre.

| Name of Variety.    | 1912       | *1913        | †1914    |
|---------------------|------------|--------------|----------|
| Spanish ... ..      | 1,100 lbs. | 2,968 lbs.   | 476 lbs. |
| Virginia Bunch ...  | 1,000 lbs. | not recorded | 776 lbs. |
| Virginia Runner ... | 1,180 lbs. | 800 lbs.     | 784 lbs. |
| North Carolina ...  | 1,320 lbs. | 644 lbs.     | 548 lbs. |
| Tennessee Red ....  | —          | 684 lbs.     | 496 lbs. |
| Native Variety ...  | 592 lbs.   | —            | —        |

Trials conducted with four of the above varieties on poor unmanured, newly broken sand soil at the Matabeleland Experiment Farm in 1913 gave an average yield of 500 lbs. unshelled nuts per acre—North Carolina here being the best yielder. Repeated in 1914 under similar conditions with a  $14\frac{1}{2}$  in. rainfall, the yields averaged 280 lbs. per acre, with the Virginia Runner as the heaviest cropper. On the same soil maize, unmanured, returned 600 to 800 lbs. of shelled grain per acre.

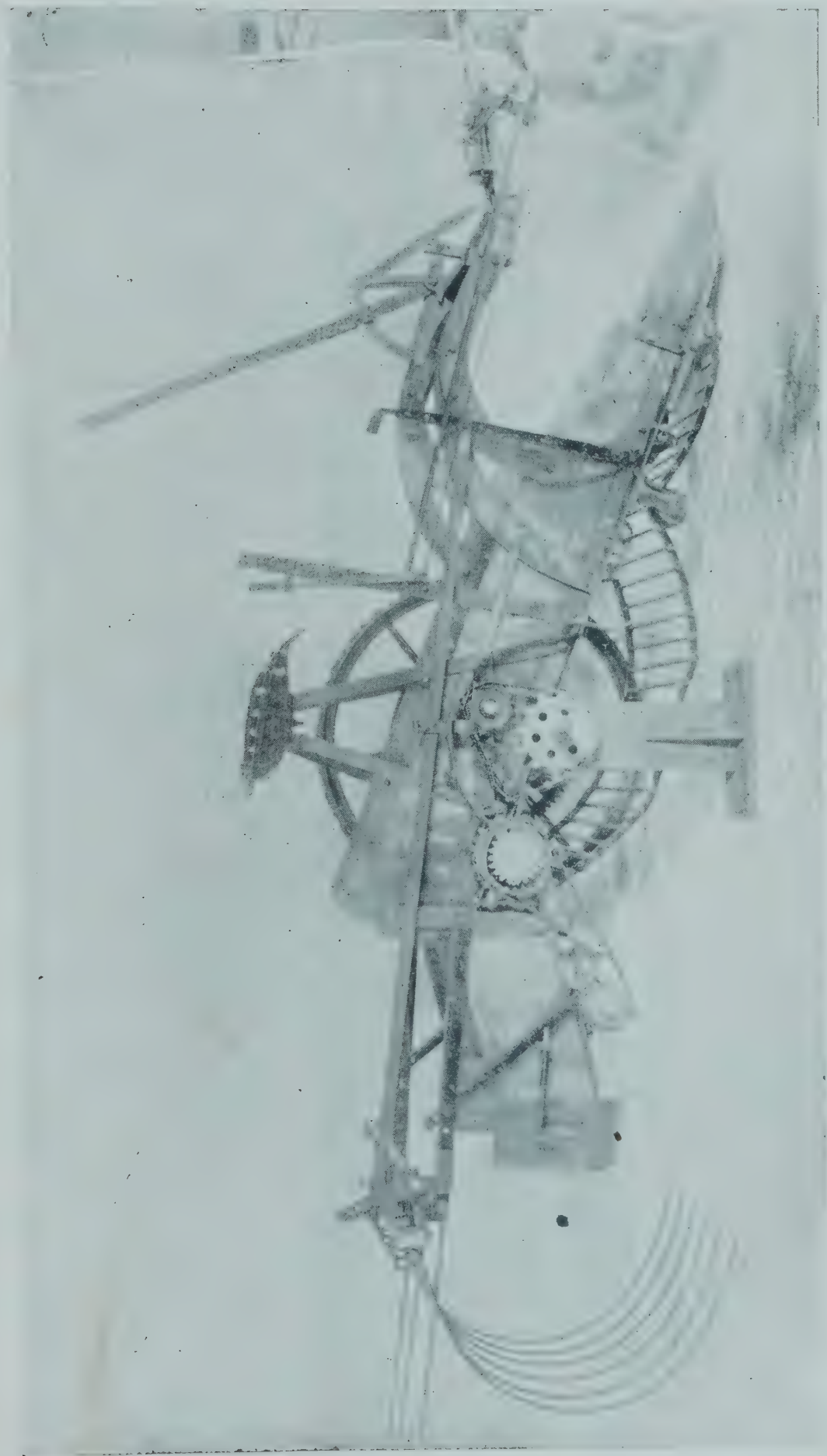
Spanish and Virginia Bunch grown in comparative trials on the Gwebi Experiment Farm during the present season have yielded 650 lbs. and 509 lbs. per acre respectively. At both farms crows were responsible for very considerable loss.

**DISEASES AND PESTS.**—Thus far the crop has shewn itself remarkably free from disease or insect pests. Cutworms sometimes do some damage, and occasionally a form of leaf curl is noticeable in some of the plants. Infected individuals should be rooted up and burned as soon as detected. The depredations of crows are the most frequent cause of serious loss, and the most effective method of scaring these gentry away seems to be to destroy a few of them by poison or gun-

\* In 1913 the germination of all varieties except Spanish was very faulty, resulting in a large number of blanks. The same varieties were also much attacked by crows and mice, further decreasing the yield. These two causes would together amount to a reduction in yield equal to 20 or 25 per cent. of the total crop.

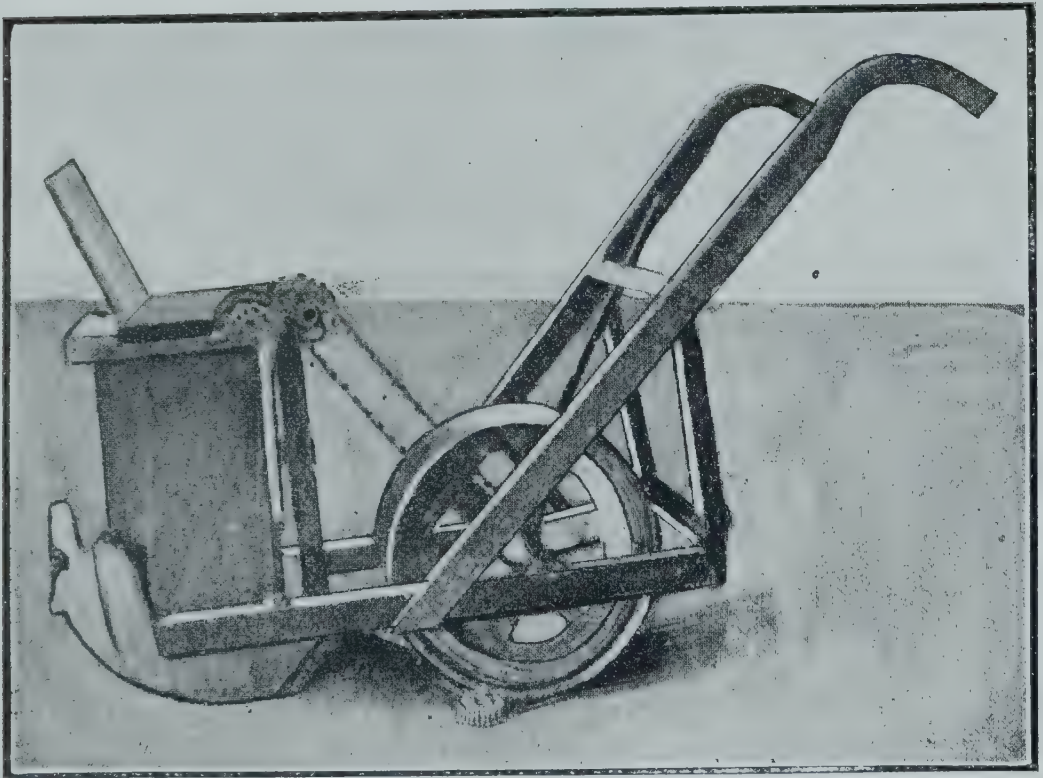
† These crops were first sown on the 13th December, 1913, but after a good germination the plants died away through lack of moisture. They were resown on the 23rd January, 1914, and this circumstance, together with the scanty rainfall during the season, rendered the crop almost a failure.





“Rice” ground-nut harvester





Single-row ground-nut planter.





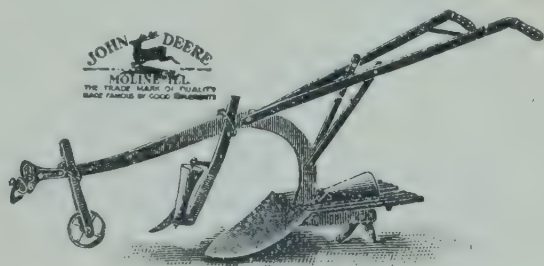


shot, dismember the victims and strew the fragments over the land. Where practised, this system has proved very successful.

**SPECIAL GROUND-NUT MACHINERY.**—Efficient machinery for handling the ground-nut crop is now on the market, and it is understood that several local implement firms are introducing complete outfits.

*Planters.*—When growing the crop on a large scale, seeding must be done with a planter. An illustration is given of a ground-nut planter much in use in the United States of America. The working of it is quite simple and needs little comment. The machine plants shelled nuts by means of a cup-wheel, is of light draught, and about the same area should be planted per diem as with a single row mealie planter. The price of planters of this type, in the United States of America, is about £3.

*Harvesting Machinery.*—The ordinary turning plough can be used as a substitute for hand labour in loosening the crop in the ground preparatory to gathering it. The general aim of a ground-nut harvester is to cut the tap root



and loosen the soil around the lateral rootlets. The “Rice” ground-nut harvester, as illustrated, will be seen to resemble in some respects a potato digger. The tap root is cut by the pointed share, and as the machine is drawn along, the plants with some soil are lifted out of the ground and pass over an endless chain formed of steel bars. Here the adhering soil is knocked off, and the vines are held in a crib at the rear of the machine. As with a hay rake, this can be lifted at intervals and the plants dropped out in small heaps. When running varieties are grown, two cutting discs can take the place of the fore carriage wheels,

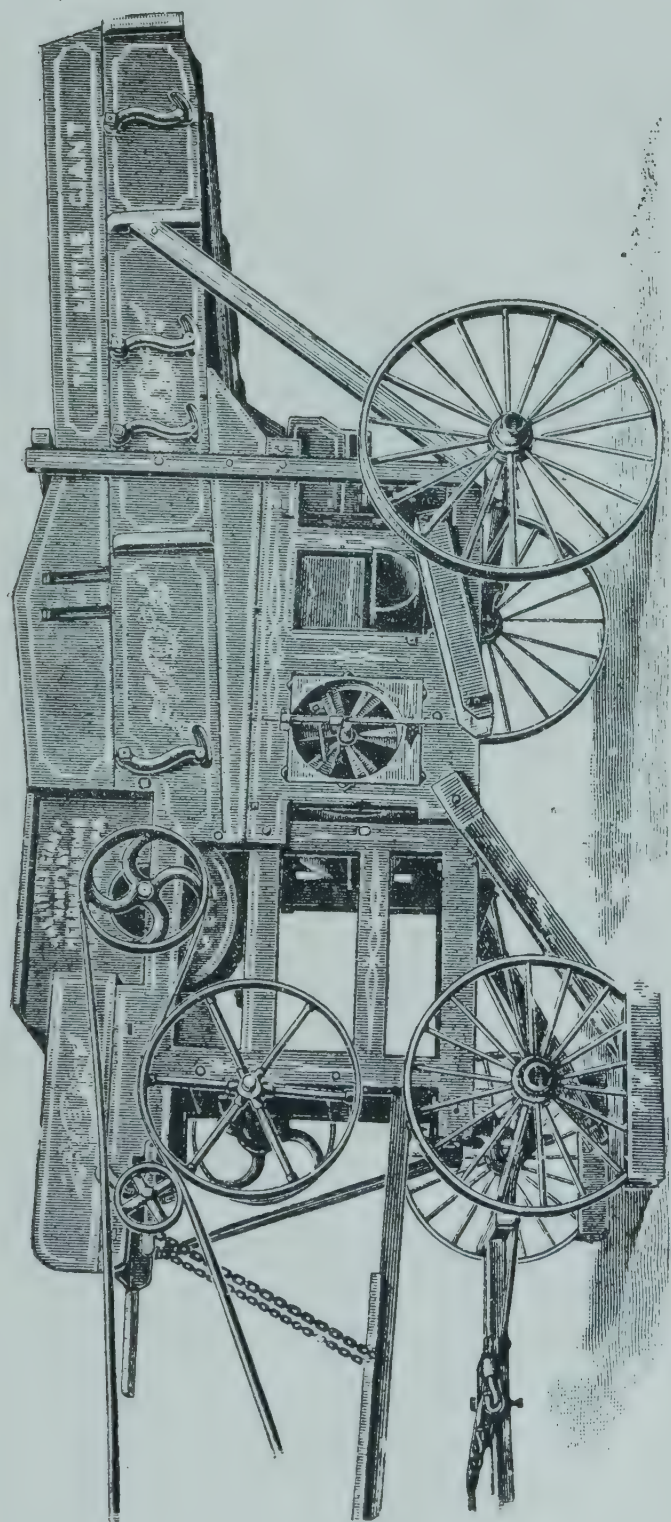
and these sever the vines mid-way on either side. The cost of this machine landed in Rhodesia will be about £25, and it is estimated to harvest about five to eight acres a day.

Another type of machine specially constructed for digging ground-nuts is that manufactured by the Champion Potato Machine Co., Indiana, U.S.A. . This implement is claimed to dig from five to ten acres a day, and should not cost more than £20 in Rhodesia. Other and cheaper machines of similar type are also manufactured. Local experience has shewn that the "Rice" harvester is not well suited for lifting ground-nuts grown on our heavy red soils, but does good work on sand soils, especially when the crop has been well ridged. The latter machine has not yet been tried in Rhodesia, but from its construction should be better adapted to heavier soils.

*Pickers and Threshers.*—The only effective machines for separating the nuts from the vines are "power" machines, known as "pickers" or "threshers." Pickers appear in more common use, and though having a smaller daily capacity, and being constructed to deal with the ground-nut crop only, they are claimed to break less nuts in the process. The average capacity of such machines is about 80 bags (80 lbs. each) per diem, while a 5 to 10 horse-power engine is required to operate them, and their cost in the United States of America is about £70 to £80. Such machines are built by the following firms:—The National Machine Corporation, Suffolk, Virginia; The Benthall Machine Co., Suffolk, Virginia; The Ferguson Manufacturing Co., Suffolk, Virginia; The J. I. Case Threshing Machine Co., Racine, Wisconsin, U.S.A.

The thresher has a larger daily capacity, up to 120 bags, and can be supplied with special attachments rendering it capable of threshing small grains such as wheat, oats, barley, rye, kafir corn, etc. It is said to crack a greater number of nuts than the pickers do. This is no serious objection where the crop is to be marketed at once, though undesirable if the product is destined for export without first being shelled. The threshers require much the same power to operate them as the pickers, and cost about the same price, though special attach-





Ground-nut picker.

ments are, of course, extra. An example of this type of machine is the Case Pea-nut Thresher.

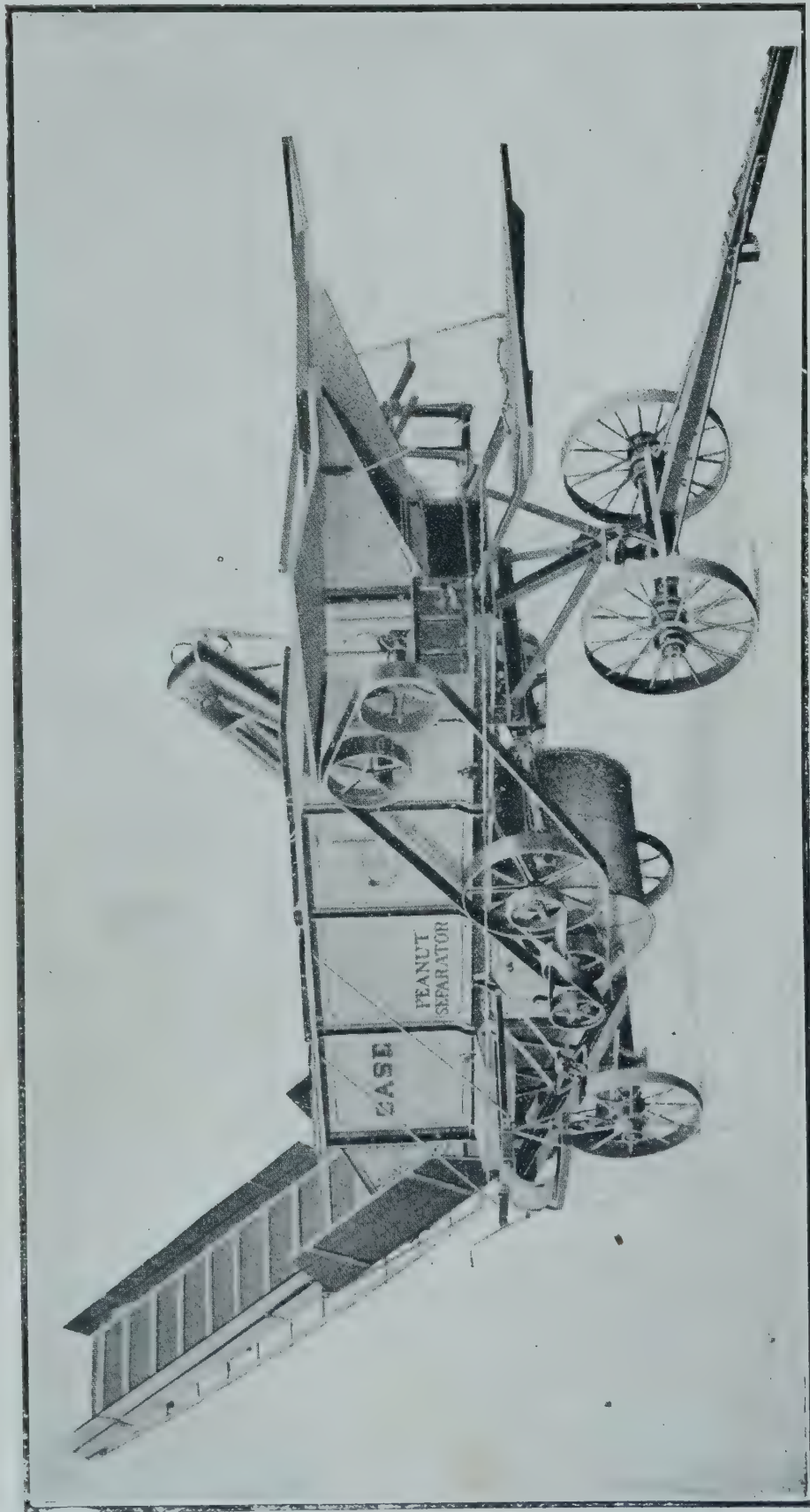
It should perhaps be pointed out that the above machines are intended to pick the whole nut from the vine. Shelling is a separate process and is frequently done at the factory, except where the shelled article is required for export. In this case it would appear best to erect a large power sheller at some central depôt and operated by a co-operative society. In this connection it may be said that a muid sack usually holds about 80 lbs. of unshelled nuts and 100 to 110 lbs. of shelled nuts. In exporting shelled nuts there is, therefore, a saving both in bags and in freight, but the shelled product requires more careful handling, and must be quite dry, otherwise the nuts are liable to heat.

**USES OF THE GROUND-NUT AND MARKET PRICES.**—The kernel of the ground-nut has two main uses—(a) for human consumption, in the form of roasted dessert nuts, or as sweet-meats and confectionaries, for which purpose the large white kernelled, red hulled nut is preferred; (b) for oil, for which purpose the smaller nut, poorer in appearance, is generally used. The use of ground-nuts in confectionery is far more general than is commonly known, and large quantities of high grade nuts are imported annually into South Africa for this purpose. As an oil producer the nut may contain from 38 to 50 per cent. of oil, depending largely on the variety grown. The higher grades of ground-nut oil are used in the adulteration of olive oil and in the making of edible fats, while the lower grades are utilised in the manufacture of soap, candles, etc. Marseilles is the great centre for the production of ground-nut oil and its by-products, supplies being drawn from Africa, India, China and Spain.

As far as local markets are concerned, the mines in this Territory consume a quantity of ground-nuts annually, prices ranging from 7s. 6d. to 10s. per bag, and sometimes even higher.

The following report was received some three years ago on the position of the ground-nut market at that time in Great





Ground-nut threshing machine.





Britain, and since then the tendency has been, if anything, towards an increase in price.

“There is no difficulty in selling ground-nuts in this country, provided they are shipped in quantities of not less than fifty tons. There is no market for *unshelled* nuts, and it is of the utmost importance that the nuts reach this country in a thoroughly sound condition. The current market price is about £13 10s. per English ton (approximately 12s. per 100 lbs.). As a rule ground-nuts are packed in bags of about one and a quarter hundredweights. It is important to notice that unshelled nuts are absolutely useless here.”

It will be seen, therefore, that for the English market shelled nuts are necessary, but that Marseilles is open to take either unshelled or shelled nuts, the latter, however, appearing the more profitable form in which to export.

AMERICAN SUPPLIES.—In America this crop is known as the pea-nut, and is grown in commercial quantities in eight States, but of the total output it is estimated that Virginia and North Carolina produce one-half. The 1905 crop was estimated at 14,000,000 bushels (bushel equals 22 lbs.), of which the two above-named States produced 4,000,000 bushels each. The value of nuts placed on American markets, exclusive of that retained for planting and home consumption on the farm, was estimated at £2,100,000.

In spite of so large a home production, the United States yet requires to import pea-nuts—the importation through Atlantic ports in 1904 amounted in value to £13,161, supplies being chiefly drawn from Spain, while the Pacific ports imported to the value of £17,541, mainly from Japan and China. At the time these statistics were given, no pea-nut oil mills were in operation on a commercial scale, and the supplies indicated were required for human consumption.

ADDITIONAL USES FOR THE GROUND-NUT.—In connection with the production of oil, the by-product of the ground-nut forms an excellent oil cake suitable for feeding purposes. In the United States the nuts are used very largely as a pig feed—the pigs being allowed to harvest the crop for themselves. For the production of good quality pork, a feeding ration

FEEDING VALUE OF GROUND-NUT HAY, AS COMPARED WITH HAY  
OF OTHER CROPS.\*

|  | MOISTURE  |       | DRY MATTER |       |                    |                |              |
|--|-----------|-------|------------|-------|--------------------|----------------|--------------|
|  | Per cent. |       | Protein    | Fats  | Carbo-<br>hydrates | Crude<br>Fibre | Crude<br>Ash |
| Ground-nut Hay ...                     | ...       | 7.83  | 11.75      | 1.84  | 46.95              | 22.11          | 17.04        |
| Ground-nut Vine, whole plant with nuts |           | 6.25  | 13.48      | 15.06 | 36.28              | 29.16          | 6.02         |
| Clover Hay ...                         | ...       | 14.30 | 12.84      | 2.11  | 48.31              | 29.27          | 7.47         |
| Timothy Hay ...                        | ...       | 13.50 | 7.17       | 1.97  | 52.94              | 33.41          | 4.51         |
| Cow-pea Hay ...                        | ...       | 10.29 | 19.72      | 4.04  | 45.15              | 21.99          | 9.10         |
| Lucerne, Alfalfa ...                   | ...       | 6.95  | 16.48      | 2.02  | 42.62              | 31.38          | 7.49         |

\* From Bailey's "Cyclopedia of American Agriculture."



AVERAGE COMPOSITION OF THE FOOD CONSTITUENTS IN DIFFERENT PARTS  
OF THE GROUND-NUT PLANT.\*

|                              | Water     | Ash       | Protein   | Fibre     | Nitrogen<br>Free<br>Extract | Fat       | Nitrogen  |
|------------------------------|-----------|-----------|-----------|-----------|-----------------------------|-----------|-----------|
|                              | Per cent. | Per cent. | Per cent. | Per cent. | Per cent.                   | Per cent. | Per cent. |
| Kernels ...                  | 7.85      | 2.77      | 29.17     | 4.29      | 14.27                       | 49.20     | 4.67      |
| Vines cut before blooming    | 31.20     | 10.61     | 12.63     | 22.32     | 48.34                       | 6.07      | 2.02      |
| Vines cut when fully ripe    | 31.91     | 12.08     | 10.81     | 32.28     | 39.81                       | 5.02      | 1.73      |
| Hay ...                      | 7.83      | 17.04     | 11.75     | 22.11     | 46.95                       | 1.84      | 1.88      |
| Vines without leaves         | ...       | 8.80      | 6.25      | 32.95     | 49.49                       | 2.50      | 1.00      |
| Leaves ...                   | ...       | 10.90     | 10.00     | 21.51     | 54.09                       | 3.50      | 1.60      |
| Roots ...                    | 28.74     | 9.58      | 7.63      | 48.59     | 31.00                       | 3.20      | 1.22      |
| Hulls ...                    | 12.94     | 3.39      | 7.22      | 67.29     | 19.42                       | 2.68      | 1.77      |
| Skins (inner coat of kernel) | 10.80     | 5.72      | 25.11     | 20.96     | 26.89                       | 21.52     | 4.00      |
| Meal ...                     | 10.74     | 5.48      | 52.49     | 5.93      | 27.26                       | 8.84      | 8.40      |

\* From "Bailey's "Cyclopedia of American Agriculture."

composed solely of ground-nuts is not to be recommended, as the fat is said to become soft and oily, but used in conjunction with suitable starchy food such as maize, ground-nuts will be found a profitable crop to grow for pigs. The value of the crop as a soil renovator has already been dealt with. It has still a further value, namely, in the haulm or vine as a winter feed for stock. In order to obtain this in good condition, the crop should not be allowed to dry out too completely before harvesting. The yield of haulm varies from half to one and a half tons per acre, and in feeding value, if well saved, compares favourably with clover hay and cowpea hay.

From the foregoing remarks it seems evident that the growing of ground-nuts in rotation with maize and other crops may profitably be taken up on a large scale in this Territory, and the fact that oversea markets are open to us, should production exceed local demands, is an economic factor of the first importance. The question of an export trade in this product is one which deserves the earnest attention of the farming community, and should be taken up by our local co-operative societies.

# The Manuring of Maize on the Government Experiment Farm, Gwebi.

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Agricultural Chemist.

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The *residual value* of fertilisers being an important consideration in the study of manures and their economic value in the production of maize and other crops, the land upon which a maize manurial trial was conducted in season 1911-12 was again planted with maize in the seasons 1912-13 and 1913-14 without a further application of fertiliser.

A full description of the experiment and the results obtained in the first and second seasons after the application of the fertilisers appeared in the *Agricultural Journals* for August, 1912, and August, 1913, respectively, and whilst it will be necessary here to recapitulate some of the more important features of those reports, the reader is referred to those issues of the *Journal* for a detailed account of the experiments, as well as more precise details regarding the character and composition of the soil upon which the trial was conducted.

The value of fertilisers in farm practice has become so generally recognised that they are now a feature of modern agriculture, and though there are farmers, among them some of our best, who still profess to scorn their use and prefer to rely upon the virgin fertility of the land, with occasional dressings of stable or kraal manure, yet it must be recognised that unless steps are taken to replenish arable land with the elements of fertility—nitrogen, phosphoric oxide and potash—or, in other words, feed the soil in return for what is reaped therefrom, its condition must necessarily fall.



In the trial now under consideration, the elements of fertility—nitrogen, phosphoric oxide and potash—were supplied in the following forms:—

Supplying nitrogen—Nitrate of soda, containing 15 per cent. nitrogen.

Supplying phosphoric oxide—Double superphosphate, containing 42 per cent. phosphoric oxide soluble in water.

Supplying potash—Sulphate of potash, containing 50 per cent. potash.

The above-mentioned fertilisers, each of which owes its value to the presence of one constituent of plant food only, were used in various combinations in order to gauge the effect of an application of each manurial constituent upon the yield of maize.

As stated in previous reports, the land selected for the experiment, which has been carried out in co-operation with the Government Agriculturist, was a red loam common to most parts of the Gwebi flats. This land has now been under maize for the past five years, the crop for the two seasons prior to 1911-12 being grown without any manurial treatment.

Selected seed of the Salisbury White variety has been used each season since the trial was instituted three years ago, and each manurial treatment has been conducted in duplicate, the size of each plot being one acre. In the selection of the area for the experiment we have been particularly fortunate, as the returns obtained from the duplicate plots have each year shewn remarkable uniformity, indicating that the land under trial is of even fertility, which fact, coupled with the uniform lie of the land and the great care that has been exercised in the harvesting and the general conduct of the experiment, has doubtless reduced the experimental error to a minimum.

On the Government farm the rainfall returns for the past three seasons were as follows:—

|                  | 1911-12. | 1912-13. | 1913-14. |
|------------------|----------|----------|----------|
| September ... .. | 0.00     | 0.00     | 0.48     |
| October ... ..   | 0.00     | 0.02     | 0.35     |
| November ... ..  | 0.25     | 0.90     | 4.41     |
| December ... ..  | 4.25     | 11.01    | 2.60     |
| January ... ..   | 13.00    | 6.80     | 7.74     |
| February ... ..  | 8.00     | 9.92     | 14.23    |
| March ... ..     | 1.25     | 6.86     | 0.45     |
| April ... ..     | 1.50     | 3.12     | 1.12     |
| May ... ..       | 0.00     | 3.13     | 0.00     |
| June ... ..      | 0.08     | 0.00     | 0.25     |
|                  | 28.33    | 41.76    | 31.63    |

From the above it will be noted that the rains during the past season set in early, 5.24 inches falling during the period September to November, whereas for the same period in 1911 and 1912 the returns were only 0.25 and 0.92 inches respectively. The land last season was, therefore, in first-class condition at the time of planting, which contributed in no small measure to the highly satisfactory yields obtained.

Particulars of the preparation and after cultivation of the land each year are as follows:—

Season 1911-12—Ploughed once to a depth of 7 inches, run over twice with a clod crusher and twice disc harrowed. During the growing season the land received two cultivations.

Season 1912-13—Ploughed once, clod crushed twice and disc harrowed twice. During the growing season the land received two cultivations.

Season 1913-14—Ploughed once, spike harrowed twice, clod crushed once and disc harrowed. During the growing season the land received four cultivations.

The date of planting each season was as follows:—

Season 1911-12—6th January.

Season 1912-13—26th to 30th November.

Season 1913-14—24th to 26th November.

Particulars of the manurial dressings, which were applied broadcast in season 1911-12, and their effect upon the yield of maize in 1912, 1913 and 1914, are given in the following table:—

| Manurial dressing<br>per acre.    | Effect of fertilisers<br>in 1912, first season<br>after application. |   | Effect of fertilisers<br>in 1913, second<br>season after<br>application. |   | Effect of fertilisers<br>in 1914, third season<br>after application. |   | Combined yields<br>obtained in seasons<br>1912, 1913 and 1914,<br>and increase result-<br>ing from application<br>of fertiliser. |  | Value of<br>three<br>years'<br>increase<br>at 8/-<br>per bag. | Cost of<br>manurial<br>dressing<br>per acre. |
|-----------------------------------|--|---|--|---|--|---|--|--|---|--|
|                                   | Total<br>yield of<br>grain<br>per acre,<br>lbs.                      | Increase<br>due to<br>manuring<br>per acre,<br>lbs. | Total<br>yield of<br>grain<br>per acre,<br>lbs.                          | Increase<br>due to<br>manuring<br>per acre,<br>lbs. | Total<br>yield of<br>grain<br>per acre,<br>lbs.                      | Increase<br>due to<br>manuring<br>per acre,<br>lbs. | Total yield<br>of grain<br>in three<br>seasons<br>per acre,<br>lbs.  | Total in-<br>crease in<br>three sea-<br>sons due to<br>manuring<br>in season<br>1911-12 per<br>acre,<br>lbs. |   |  |
| 1. No Manure                      | 1,248†   | —   | 1,827†   | —   | 2,886†   | —   | 5,961  | —  | —   | —  |
| 2. 75 lbs. Double Superphosphate  | 1,612  | 364   | 2,145  | 318   | 3,122  | 236   | 6,879  | 918  | 36/8  | 13/-   |
| 3. 75 lbs. Nitrate of Soda        | 1,634  | 386   | 2,296  | 469   | 3,259  | 373   | 7,189  | 1,228  | 49/1  | 25/-   |
| 4. 40 lbs. Double Superphosphate  | 1,642  | 394   | 1,855  | 28  | 2,565  | 321<br>(decrease)                                   | 6,062  | 101  | 4/-   | 20/8   |
| 5. 75 lbs. Nitrate of Soda        | 2,220  | 972   | 2,161  | 334   | 3,368  | 482   | 7,749  | 1,788  | 71/6  | 19/6   |
| 6. 40 lbs. Double Superphosphate  | 2,396  | 1,148   | 2,329  | 502   | 3,323  | 437   | 8,048  | 2,087  | 83/5  | 32/6   |
| 7. 75 lbs. Nitrate of Soda        |  |   |  |   |  |   |  |  |   |  |
| 8. 40 lbs. Double Superphosphate  |  |   |  |   |  |   |  |  |   |  |
| 9. 75 lbs. Nitrate of Soda        |  |   |  |   |  |   |  |  |   |  |
| 10. 40 lbs. Double Superphosphate |  |   |  |   |  |   |  |  |   |  |

† Average of three check plots.



As already mentioned, the uniformity in the nature of the soil used for the trial with which this report deals is manifested by the close agreement between the yields on the duplicate plots. Taking, for example, the two manurial dressings which effected the largest increases—viz., Nos. 5 and 6—the yields on the duplicate plots for the three years were as follows:—

| Dressing |             | 1912  | 1913  | 1914  | Combined yield for the three years | Difference |
|----------|-------------|-------|-------|-------|------------------------------------|------------|
|          |             | lbs.  | lbs.  | lbs.  | lbs.                               | lbs.       |
| No. 5 {  | Plot No. 6  | 2,162 | 2,286 | 3,279 | 7,727                              | } 45       |
|          | Plot No. 15 | 2,278 | 2,037 | 3,457 | 7,772                              |            |
| No. 6 {  | Plot No. 7  | 2,368 | 2,432 | 3,358 | 8,158                              | } 219      |
|          | Plot No. 14 | 2,424 | 2,227 | 3,288 | 7,939                              |            |

In reference to the foregoing table of yields, attention is drawn to the following points:—

The return from each plot in 1914 (third season after the application of fertiliser) was higher than that obtained from the same plot in the previous two years. This was doubtless due to the good season experienced on the farm, continued selection of seed, to the excellent stand of plants and to thorough cultivation. In fact, of the three seasons, the first (1911-12) was the least favourable, which, with the lateness of planting that season, accounts for the much lower yields then obtained. Noting that the unmanured blocks gave a much higher average return per acre in the past season than in either of the previous two years, it may appear to the reader that the land was not deficient in available plant food, and on that account the application of fertiliser was at present unnecessary. Whilst the results make it perfectly clear that the land contains a sufficient supply of available plant food to yield a good return in a good season, it is nevertheless evident that the application of fertiliser supplying those food elements in which the soil is most deficient produces in the case of some dressings an increased return which at a conservative valuation defrayed the cost of the manure and left a very sub-

stantial profit. The intimate way in which the feeding fibrous roots of a plant will surround a fragment of fertiliser is a matter of common knowledge: thereby the plant is enabled the more easily to obtain a supply of food, which is in turn conducive to more rapid growth, a more robust plant, and consequently an increased yield.

Of the three fertilisers used, superphosphate had the most marked effect upon the yield of grain. This is shewn by the results obtained in the case of dressing No. 4, which supplied nitrogen and potash, but no phosphoric oxide. An examination of the average return obtained on the plots receiving this dressing shews that in the first season after application there was an increase over the unmanured land of 394 lbs. per acre, in the second of 28 lbs., and in the third a *decrease* of 321 lbs., whereas on the plots receiving superphosphate *alone* the average increased returns (over the unmanured land) in the first, second and third seasons were 364, 318 and 236 lbs. respectively.

Evidently the store of available phosphoric oxide in the red soil under trial is very limited,\* and in consequence phosphatic manures must enter largely into the composition of mixed fertilisers for that class of land.

Having decided that, of the three fertilisers used, superphosphate had the greatest influence upon the yield of grain, we will now compare the effect of nitrate of soda and sulphate of potash respectively, *used in conjunction with superphosphate*—viz., dressings Nos. 3 and 5—but before attention is drawn to the results obtained on these plots, it should be pointed out that little or no nitrate of soda remains in the land one year after application. Soil has very little retentive power for this fertiliser, and what is not made use of in the first year is largely, if not entirely, washed out of the soil. It may be concluded, therefore, that the nitrate of soda applied in season 1911-12 had practically no influence upon the yield in seasons 1912-13 and 1913-14. Superphosphate and sulphate of potash are, on the other hand, not easily washed out of the

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\* The deficiency in available phosphoric oxide is borne out by the chemical analysis of the soil given in the second report of this trial in the *Agricultural Journal* of August, 1913.



land, consequently the major portion of any residue remaining after the first season's crop is taken off will be available for succeeding crops.

It will be observed in the case of the nitrate of soda plus superphosphate dressing (No. 3) that the increase over the unmanured land in the first season after application was 386 lbs. per acre, and in that of the sulphate of potash plus superphosphate dressing (No. 5) 972 lbs. for the same period. As nitrate of soda is for the most part removed in the first season after application, the increased return resulting from dressing No. 3 in the second and third seasons must be due to residual superphosphate only. These increases were 469 lbs. and 373 lbs. per acre respectively, which agree, within the limits of experimental error, with the increased returns in the second and third seasons resulting from the application of superphosphate alone (dressing No. 2). In fact, comparing the effect of dressings Nos. 2 and 3 in the first season after application, it will be observed that the addition of nitrate of soda to superphosphate had no material influence upon the yield of grain.

The addition of sulphate of potash to superphosphate (dressing No. 5), on the other hand, effected a marked improvement in the yield, compared with the use of superphosphate alone in the first season after application, the increased returns being 972 lbs. and 364 lbs. per acre respectively. In the second and third seasons the increased yields from the use of superphosphate and sulphate of potash were 334 lbs. and 482 lbs. per acre respectively, which agree, within the limits of experimental error, with the increased yields for the same period resulting from the use of superphosphate alone. The natural inference regarding sulphate of potash, which had such a beneficial effect in the first season, is that no residue remained in the surface soil after the first season, or, if there was a residue, it had practically no effect upon the yield.

The fact nevertheless remains that the addition of 40 lbs. of sulphate of potash to the superphosphate per acre increased the return in the first season, compared with the increase resulting from the use of superphosphate alone, by 608 lbs..



which was corroborated by duplicate plots. The conclusion we are justified in drawing is, therefore, that potash ranks next in importance to phosphoric oxide in maize fertilisers for the red maize land under trial.

Although nitrate of soda, *used in conjunction with superphosphate*, had no material influence upon the yield, when compared with the use of superphosphate alone, it is to be noted that the complete dressing No. 6—viz., superphosphate, sulphate of potash and nitrate of soda—effected a small increase (namely, 176 lbs.) over the yield obtained where dressing No. 5 (superphosphate and sulphate of potash) was used. Whilst this difference in yield cannot be claimed to be beyond the limits of experimental error, there are strong indications from the uniformity of the results obtained on the duplicate plots that the nitrate of soda was to some extent responsible for the increase recorded, and it is certainly my considered opinion that nitrogen should not altogether be omitted from maize fertiliser for red land in this country.

Although the results obtained in this trial indicate that the complete dressing (No. 6), costing 32s. 6d. per acre, gives very profitable returns, yet it has to be realised that such an outlay is somewhat heavy; accordingly the dressing recommended for the present for red land is a mixture made up as follows:—

|                               |             |
|-------------------------------|-------------|
| 35 lbs. nitrate of soda       | } per acre. |
| 65 lbs. double superphosphate |             |
| 25 lbs. sulphate of potash    |             |

This dressing costs 20s. per acre.

In the original dressing (No. 6)—viz., 75 lbs. nitrate of soda, 75 lbs. double superphosphate and 40 lbs. sulphate of potash—the ratio of the food elements (nitrogen, phosphoric oxide and potash) present is as follows:—

|          |                                |        |
|----------|--------------------------------|--------|
| Nitrogen | Water soluble phosphoric oxide | Potash |
| 1        | 2.8                            | 1.7    |

In the above recommended dressing the *relative* proportions are:—

|          |                                |        |
|----------|--------------------------------|--------|
| Nitrogen | Water soluble phosphoric oxide | Potash |
| 1        | 5.2                            | 2.3    |

It will be observed that the amounts of phosphoric oxide and potash have been raised, compared with the original dressing. The reason for this alteration will be clear from the analysis of the results obtained in this trial.

For those farmers who do not propose to purchase the simple fertilisers and mix them together in the required proportions on the farm, mixed fertilisers, the compositions of which are based upon the above recommendations, are obtainable from the following firms:—Messrs. Anglo-African Trading Co., Salisbury; Messrs. Rhodesia Colonisation and Estate Agency, Salisbury; Messrs. Philippi & Co., Salisbury. The prices quoted by these firms vary with the degree of concentration of the fertiliser, but the relative proportions in which the food elements are present are as above recommended.

# The Dusty Surface Beetle.

(*OPATRUM ÆQUALE*.)

By R. W. JACK, F.E.S., Government Entomologist.

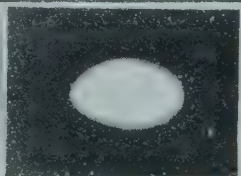
The insect to which the above name is here applied for the first time is chiefly known from its habit of devouring maize seed when planted in dry soil. It has already received some notice in the pages of this *Journal* (see Vol. X., No. 3, page 404—"Two Destructive Beetles"), but as at the time the notes appeared nothing was known of the life history and larval habits of the pest, no apology is needed for the present paper, which embodies the results of the last two years' study of the insect both in the field and in the laboratory. Further experiments have shewn the value and economy of the poisoned bait method of dealing with the pest, and it is a matter for congratulation that so simple and inexpensive a method of getting rid of these undesirable inhabitants of our lands lies within our reach. Further knowledge of the habits of the insect has, moreover, indicated the most suitable times for applying the bait, and has, as is usual, increased our ability to deal with the pest.

The adult insect is a flattish beetle living on the surface of the soil. It measures rather over one-third of an inch in length, is almost always covered with dust and small particles of earth, rendering it the same colour as its environment, and is generally to be found under clods of earth and in other sheltered situations during the day time, its habits being largely nocturnal. To be more precise, an average specimen measures 9 m.m. by 4 m.m., but specimens are to be found up to 11 m.m. by 5 m.m. The adhesion of the dust and earth particles is secured by a great number of small strongly curved spines or hooks which cover the back of the wing





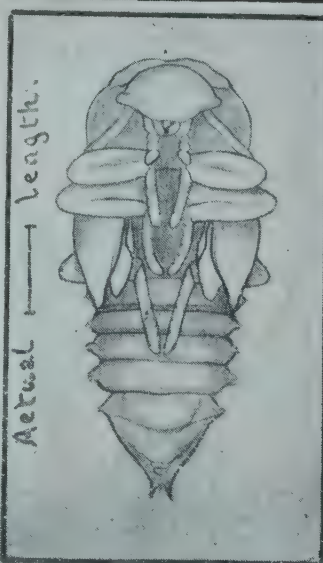
Beetle - enlarged 4 times.



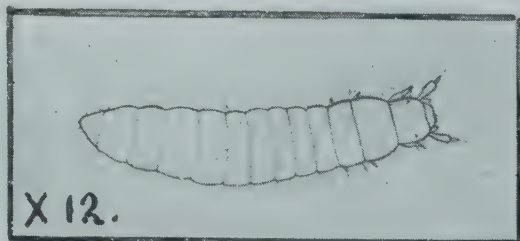
Egg. X 12.



Life Size.

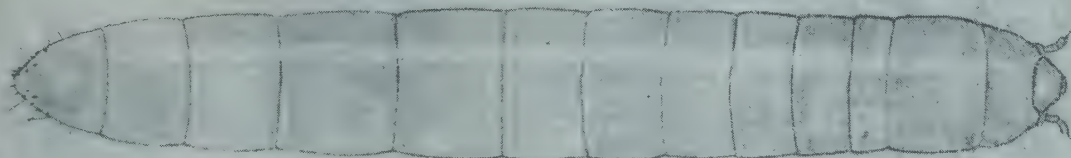


Pupa. X 5.

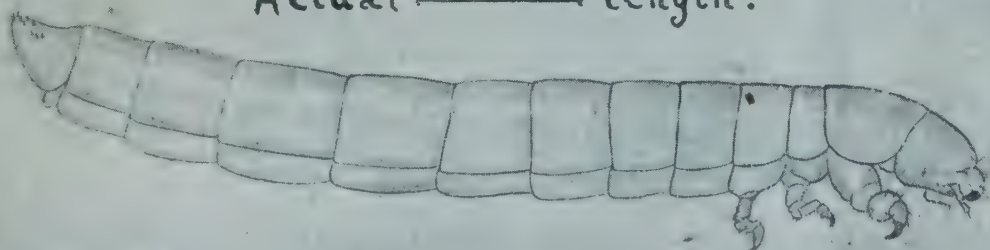


X 12.

Larva - a few days old.



Actual ——— length.



Larvae - enlarged.



covers and thorax, and serve to retain small particles with which they come in contact, hence the popular name given above. The actual colour of the insect itself is black. Although it rarely makes use of them, the beetle is furnished with a pair of sufficiently developed wings and is capable of flight, a capability not shared by all the members of the family (*Tenebrionidae*). Specimens occasionally fly into lighted rooms at night. In general habit it is sluggish, and feigns death when alarmed. It is, on the whole, one of the least obtrusive of insects.

These beetles are to be found almost everywhere in cultivated lands on the diorite, both the red and the black soils, and have also been found plentifully on the sandstone. On the granite they do not seem to be so prevalent. Its preference would seem to be for loamy soils, and it certainly tends to avoid those of a very light sandy nature. In a badly infested field on the diorite several hundreds may sometimes be found under a fair-sized clod. They are nearly always found associated with the allied Slaty Surface Beetle (*Emyon tristis*), which does similar damage to maize seed.

The female deposits her eggs singly in the soil, not far from the surface. They are attached to any convenient object. They are dull white, and lack ornamentation of any sort. An average specimen measured .87 m.m. by .54 m.m.—that is to say, twenty-nine eggs placed end to end would measure about one inch. The eggs hatch readily whether under wet or dry conditions, the larvæ emerging in from seven to ten days from the date of deposition. The newly hatched larva measures just under 2 m.m. in length. It is translucent yellowish white in colour, and exhibits an active disposition from the first. The form may be seen by reference to the plate. The growth of the larva is comparatively rapid for this type of insect, an observed specimen reaching a length of 12 m.m. in 20 days, but this was under somewhat unnatural conditions in the laboratory. In a more natural environment the larvæ attained a growth of from 6 to 10 m.m. in rather over two months. When full grown the measurement is about 15 m.m., or three-fifths of an inch. The larva is yellowish in colour and possesses a tough, shiny integument. To some extent it resembles the insects known as “wireworms” in Europe and America,



but it belongs to quite a different family. The grubs of *Opatrum* and other common members of the family *Tenebrionidae*, to which the surface beetles belong, may easily be distinguished from the true "wireworms" (*Elateridae*) by the fact that the first pair of legs is considerably stouter than the other two pairs (see plates), a peculiarity not shared by Elaterid grubs. When fully developed the larva forms an earthen chamber in the soil, rough outside but smooth within. It is very fragile, the earth particles being cemented together but lightly, and its internal diameter is about 8 to 9 m.m. Within this the larva changes to a whitish pupa (see Plate I.) the length of which is about 8.5 m.m. A larva pupated on the 12th January, and the adult appeared on the 23rd, but was not fully hardened until the 24th. The duration of the pupal stage was, therefore, 11 days in this instance.

*Seasonal Prevalence.*—The insect proves to be single-brooded, but there are certain peculiarities in the way this is brought about. Observations in the field have shewn that during the past two years the bulk of the adults have emerged during the early part of December. The actual time may, of course, be dependent somewhat on the season. Adults collected at this time, however, refuse to lay eggs until the main part of the rains are over, and the same result has been obtained by collecting beetles in January and February. The earliest deposition of eggs in the records occurred during the latter part of March, but eggs are laid freely during April, May and June, and oviposition continues to a lesser extent throughout the dry season, even as late as the end of September. Numerous tests having shewn that the beetles were ovipositing most freely in the early part of the dry season at the Agricultural Experiment Station, Salisbury, and that the adults emerged in great numbers about December, we may take it that this represents the main period of development under field conditions. We have unfortunately failed to rear to adults any of the hundreds of eggs obtained in April, May and June, although the larvæ attained a considerable size. From a batch of eggs laid at the end of September, 1913, adults, however, emerged at the end of January. The development would seem, therefore, to have been accelerated by the warmer weather. It should be noted, however, that adults are scarce

in the field from late September until the middle of November, so that these eggs, although produced under natural conditions, represent the termination of the egg-laying season. Broadly speaking, the bulk of the adults live without ovipositing from December to March, egg-laying is mainly carried out in April, May and June, the larvæ develop during the winter months, pupation takes place towards the end of November, and the adults emerge in December. Exceptions undoubtedly occur, but the above holds good with the great bulk of individuals. The following diagram indicates the increase and decrease of the different stages of the insect in the different months of the year.

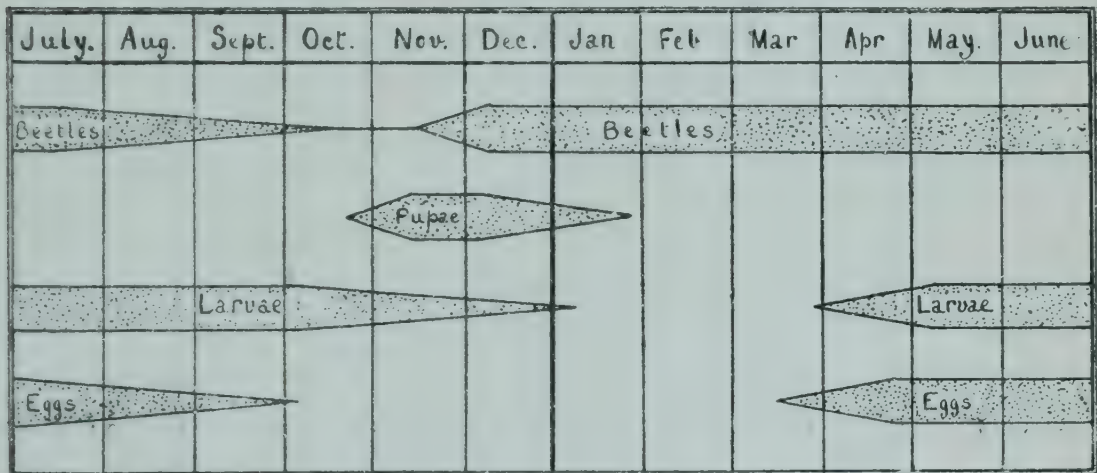


Diagram illustrating the increase and decrease of the different stages of the Dusty Surface Beetle (*Opatrum æquale*) during the different months of the year.

*Feeding Habits.*—The beetles shew a liking for very varied articles of diet between which it is difficult to see any connection. They very greedily devour the dry seeds of maize, etc., shewing a predilection for the germ, and are chiefly injurious on this account. They will also attack green plants, and when tobacco is planted on suitable soil may prove very injurious to the newly set out plants. Besides tobacco, they have been observed to gnaw the stems of potato and various cruciferous plants, and even to nibble at the heart leaves of young maize—in fact, it is likely that they are not particular as to the green food taken. It has been noted, however, that plants in active growth do not suffer, although the beetles may be present in great numbers. Plants checked or in a



stationary condition are chiefly liable to damage. Apart from such, the beetles seem to eat any sort of vegetable rubbish, and act largely as scavengers.

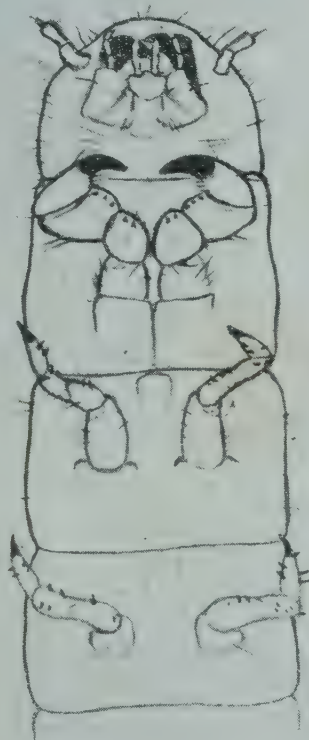
Unlike some other members of the family, the larvæ do not seem to attack growing plants, at least they have invariably failed to do so in the laboratory. The fact of the larval stage being passed mostly during the season when growing plants are absent from the lands is against the development of a habit of this nature. The fact is important, because species of *Opatrum* in such widely-separated countries as Russia, Mauritius and Sumatra have been reported as very injurious in the larval stage to wheat, tobacco and other plants. The larvæ have been found to eat decaying plants such as rotten potatoes and other rubbish of this nature, but they were also found to eat out completely seeds of wheat placed in their cages. On account of this habit they might prove somewhat injurious to wheat sown in the winter under irrigation, but germination seems to put an end to their capacity for injury.

*Remedial Measures.*—Undoubtedly the most economical and effective remedy is the destruction of the adult beetles by means of poisoned bait, as used for the destruction of cut-worms. The formula for this bait, known as the Mally formula, is as follows:—

|                                  |        |           |
|----------------------------------|--------|-----------|
| Arsenite of soda                 | ... .. | 1 lb.     |
| Black sugar, treacle or molasses | ... .. | 8 lbs.    |
| Water                            | ... .. | 10 galls. |

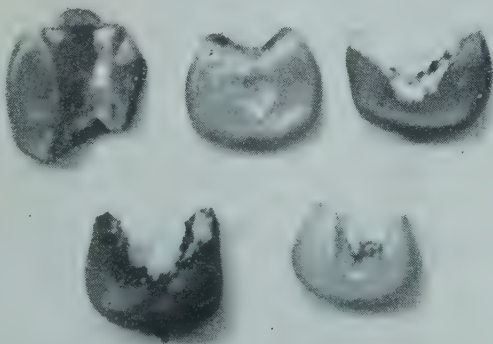
The arsenite should be dissolved in a little boiling water, as it dissolves very slowly in cold, and added to the sugar or treacle solution. A quantity of green stuff—grass answers very well—should be chopped up finely, wetted with the sweetened poison and distributed broadcast (but very thinly) over the infested land. In experiments conducted by the Entomological Division it was found that one and three-quarter sacks of the chopped bait was ample for five acres, and that a raw boy could very easily cover two acres or more in an hour. Once the operation is reduced to a system, the cost of treatment, including labour, etc., should be less than 1s. per acre. Several farmers have given the treatment a trial on a





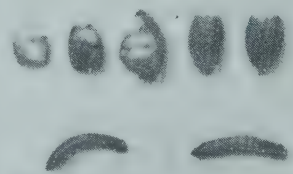
Much Enlarged.

Legs and Posterior Segment of Larva.



Nat. Size.

Maize Seed Injured by the Beetles.



Nat. Size.

Seeds of Wheat Injured by the Larvae.



considerable scale, covering several hundred acres, and all of them have expressed themselves surprised at the little outlay involved. The cost could be reduced still further by importing molasses from Natal or elsewhere by the drum, instead of purchasing black sugar locally in small quantities.

A little attention to the diagrams will shew that the bait is better applied during certain months than others. The beetles are very scarce during October and the early part of November, and if the season is forward enough for maize to be planted about the middle of November, but little damage is likely to result. At the same time it is almost useless to distribute bait at this period. Maize planted in December, especially after the first week, is liable to serious loss, and this is particularly the case if the seed is planted in dry ground in a backward season to be ready for the first good rains, a very common practice. If the beetles are present in great numbers, a week's sojourn in dry soil may mean the loss of up to half the seed planted, a loss that many farmers attribute to any cause rather than the right one. Seeing that we cannot control the seasons and that it is often a useful practice to plant in dry soil, the obvious course is to ensure the absence of the beetles that make such a practice hazardous. To wait until damage has commenced and then apply the bait will result in saving a portion of the seed, but it is obviously not the best policy. Now, the diagram shews that the adults emerge from the middle of November to the first week in December—a small proportion, of course, emerging even later—and that the adults live without laying eggs until the middle of March. By baiting the land from the time the bulk of the adults have emerged up to the time egg-laying commences we get the maximum effect as to numbers destroyed and prevention of brood for the following season. February would probably be the best month to apply the bait, as any belated adults will have emerged by then, but as the land is covered by well grown plants in that month it is not practicable. When planting is delayed until the middle of December, as it often is, the bait should obviously be applied before planting, but in an early season it would pay to bait about this time even after the crop is up, to destroy the beetles that would otherwise produce brood to do damage next season. It is per-



haps rather much to expect such foresight at a busy time of the year, but it is good counsel nevertheless. The most likely mistake is to apply the bait too early, when only a portion of the adults have emerged, say at the end of November. In carrying out experiments several mistakes of this sort have been made, and the result was that, though the lands were cleared for the time being, a fortnight later beetles were numerous again.

It is quite remarkable how eager the beetles are for sweets. They will eat the dipped grass even after it has dried up and become apparently quite unpalatable. Owing to this, they fall even readier victims to the bait than cutworms, and 80 per cent. or more may be destroyed by one application.

Certain farmers have expressed the opinion that fertiliser drilled in with the seed will keep the beetles away from the seed. If this is so, the practice would be an excellent one. The writer has, however, no experience of its effectiveness.

The beetles will collect in great numbers during the winter under heaps of grass, etc., placed about the field, and by making windrows of such inflammable material, great quantities of the beetles may be destroyed by fire. The drawback to this method is that by the time the crop is gathered and the windrows made the beetles have laid the greater portion of their eggs, so that little is gained by destroying them. Poisoned bait is so cheap and easy to apply that no other remedy is needed.

The reader should note that these beetles, together with their allies of similar habit, are almost invariably present on land suited to maize growing, and that they are largely responsible for poor or only moderate stands, of which the cause may not be apparent. By baiting an average piece of soil at the Gwebi Experiment Farm, five acres in extent, in December last, a greatly improved stand was secured compared with the surrounding ground. There is, in fact, reason to believe that it would pay almost every farmer to bait his red lands, say every two years, to keep these pests down, and thus secure the best possible stand of plants.

These notes may be concluded with something in the nature of an exhortation to maize growers. There is a con-

siderable amount of thought at the present time devoted to decreasing the cost of production of maize in this Territory and to securing heavier yields. In this connection the question of machinery, better seed and the use of fertiliser are receiving the attention they deserve. In bringing the cost of production to a minimum the primary aim is to get a maximum yield per acre, and no efficiency in handling, perfection of seed or fertility of soil will secure this if good stands are not obtained, and really good stands are not common in Rhodesia. The main cause of poor stands is the destruction of seed and young plants by insect pests, including, besides the beetle discussed in this paper, allied species and cutworms. These pests can be largely destroyed by the use of poisoned bait, the cost of which is within the means of all. To spend a shilling or so per acre on the probability of increasing the yield by a bag or more is surely a business proposition, and the writer is convinced from a large number of observations that such an increase may be expected from applying the bait at the right time, especially on the red soils and when maize is planted late on lands that have been cropped for several years.

## New Crops for Rhodesia.

### RESULTS OF EXPERIMENTS AT THE BOTANICAL EXPERIMENT STATION, SALISBURY, 1913-14.

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By J. A. T. WALTERS, B.A., Assistant Agriculturist.

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**GUINEA GRASS** (*Panicum sp.*).—A small experimental plot of this grass, a native of Portuguese East Africa, after giving great satisfaction as a green winter forage crop over two seasons, was propagated by dividing the roots and transplanting. These plants remained perfectly green and were standing over 3 ft high at the end of June. They were then cut down and new growth was made during July. It is a most promising winter grass, rivalling Napier's fodder.

**MOLASSES GRASS**.—A Brazilian species which does not flower until the end of May. This late maturing habit of the plant seems to indicate that it is a promising hay grass for late cutting. It sets seed well and volunteers freely. The name is derived from the strong smell of molasses which it emits.

**MITCHELL GRASS** (*Astrebla triticoides*), from Australia. Germination was rather poor, but the surviving plants have made fair growth and are seeding freely. This is one of the most useful of the Australian hay grasses and gives some promise.

**SIDE-OAT GRASS** (*Bouteloua curtipendula*).—This grass, introduced from America, has given but indifferent results for several seasons. It grows and seeds freely, but does not make the vigorous growth that characterises it in its country of origin. The same remarks are true of Australian Blue Grass (*Andropogon sericeus*).



**SUDAN GRASS** (*Andropogon halepense?*).—A grass of much promise as a winter fodder. It was tried both as a dry-land crop and under irrigation, the seeds being sown in March. In the former case a scanty rainfall prevented good germination, but in both cases the plants have made excellent growth, 2½ ft. in height, and are seeding profusely, being untouched by the frost.

**COW CANE**.—An undetermined plant resembling dwarf sugar cane in general appearance and likely to prove of considerable value as a green winter feed, although not of so robust growth as Napier's fodder.

**M'FUFU GRASS** (*Pennisetum sp.*) from Umtali.—An exceedingly useful winter grass resembling Napier's fodder, but with a far less vigorous growth. It is distinguished from Napier's fodder by having a slightly narrower leaf, an open centre, and a general reedy appearance. Cut down in May, it had made a few inches' green growth in June. For the purpose of winter feeding it is best to cut this plant about the end of March for ensilage, when a considerable subsequent growth will be made.

**SHEEP'S PARSLEY** (*Petroselinum sativum*).—These perennial plants shew much vigour and retained their green growth up to the end of June. Well worth inclusion in small quantities in pasture mixtures.

**MAZAGUA**, a sorghum, native of Western Africa, introduced to Rhodesia from Australia, where it is much esteemed as a fodder plant. At the Botanical Experiment Station this plant, which resembles kafir corn, has made normal growth during the last two seasons, but has shewn no outstanding qualities either in leaf or seed production. It is proposed to give it a trial on sand soil this coming season.

**WHITE SWEET SAGE** (*Salvia sp.*).—A valuable dryland pasture plant introduced from the Western States of America. None of the seeds germinated, although sown in a variety of ways.

**MILLET**, from seed furnished by Mr. Hulley, Umtali.—A short growing variety of millet, producing large sized seeds

very abundantly. This plant seems well worth an extended trial both for fodder and seed purposes.

**KANKOMA BEAN.**—A species of lentil introduced from Northern Rhodesia, where it is largely used by the natives for food. The plants made excellent growth and ripened early, producing a prolific crop of long narrow pods well filled with seed.

**LAING'S BEAN (*Mucuna sp.*).**—A species of velvet bean, differing from the ordinary variety in having a white seed and a pod free from irritating hairs. This latter feature marks it out as an improvement on the ordinary variety. The pod is also bigger and the quantity of leaf growth at least equal to that of velvet bean. The small trial of this season will be extended next season.

**DEDMAN'S BEAN.**—Another variety of velvet bean, which seemingly failed to set seed this season at the Botanical Experiment Station, Salisbury.

**TEPARY BEAN.**—This much-advertised dryland bean of the Central American States germinated well and evenly and made vigorous although short growth, setting seed freely. At maturity it shed its leaves almost entirely. It was attacked by stem maggot in the same way as cow-peas, and was far from being the heavy yielding crop it is in its country of origin.

**DOLICHOS LABLAB.**—A valuable fodder and green soiling crop, requiring a full season to mature seed, but not so sensitive to frost as velvet bean. The pods, which are borne freely, can be used as a vegetable. There is some difficulty in getting this plant from seedsmen, by whom an allied variety, *Dolichos biflorus*, is substituted.

**DHAL (*Cajanus indicus*).**—A variety with variegated seed was tried this season, with very promising results. The growth was distinctly superior to the ordinary dhal, but the plant seems later in setting seed.

**TANGIER PEA (*Lathyrus tingitanus*).**—This plant, which has a copious pea-like growth, keeps green almost through the winter. Stock, however, are not too fond of its somewhat bitter foliage. It flowered for the first time in July.

A LEGUME from the Umvukwes.—A plant whose roots bear nodules very freely. Grown from seed with a view to its utilisation as a green manuring plant. Good germination was obtained, but the plants did not make the vigorous growth of the parent plants at the Umvukwes, probably owing to the drought.

BEGGAR WEED (*Desmodium tortuosum*).—This valuable fodder plant is perhaps best sown thinly, and preferably in mixtures with grasses. Sown thickly in a pure stand this season, the plants failed to attain their normal growth.

CLOVERS.—Any attempt to grow clovers in this country has been almost uniformly unsuccessful. As the crop is such a valuable one, attempts are being continued with varieties obtained from countries having climatic or soil conditions similar to those of Rhodesia. Many new varieties were tried this season, but the scanty rainfall militated against any good results being obtained.

SUBTERRANEAN CLOVER (*Trifolium subterraneum*).—Good germination followed by good growth, but the plants died off with the approach of winter. Roots well covered with nodules.

STRAWBERRY CLOVER (*Trifolium fragiferum*).—Very little growth was made. This moisture-loving variety might probably do better under more favourable conditions.

BOYD'S CLOVER (*Lotus hispidus*).—A fair growth was made, warranting further trial. This variety was obtained from New Zealand.

BOKHARA CLOVER (*Melilotus officinalis*).—A perennial plant of great promise, and especially for green manuring purposes.

JAPANESE CLOVER (*Lespedeza striata*).—An exceedingly hardy annual with a very low habit of growth; has done particularly well at Salisbury, although the dwarf character of the plant prevents it from being of any great value as a fodder plant.

Other varieties tried without success include Burr Clover (*Medicago denticulata*), Yellow Sand Clover, Birdsfoot Tre-



foil (*Lotus corniculatus*), Alsike Clover (*Trifolium hybridum*), and *Trifolium glomerata*.

**LUCERNE.**—Several important introductions were made this season as a result of Mr. Mundy's visit to the arid regions of America, where many varieties of this crop are grown. The introductions have been divided into those requiring irrigation, and dryland varieties, and are receiving treatment accordingly. In some cases inoculation with nodule-forming bacteria has been tried. It is too soon to speak of results yet. Some of the irrigated varieties have done extremely well, however, and in particular one, Peruvian lucerne, which is now standing 2 ft. high, and Arizona lucerne, standing 18 ins. high, both having been sown on the 16th February, 1914.

**JUTE** (*Corchorus capsularis*).—On a trial plot fair germination was obtained from seed supplied by Mr. F. Eyles. The plants made healthy growth, but only reached a height of 2 ft. and failed to set seed. Here again the drought was partly responsible for the poor result obtained.

**OCHRA** (*Hibiscus esculentus*).—An Indian vegetable, the fruit pods of which are edible. Germination was poor from fresh seed, and the pods were largely attacked by weevil.

**INDIAN MILK MARROW.**—Good germination was obtained in this case, but the plants were attacked by beetles immediately above ground, and failed to flower or set seed.

**GIANT EGG PLANT** (*Solanum esculentum*).—These plants only made a few inches' growth, never flowered, and died away with the approach of winter.

**HOP SEED.**—No germination was obtained. The difficulty of growing this plant from seed has been noted in the *Rhodesia Agricultural Journal* (April, 1914, page 558).

**SAFFRON** (*Carthamus tinctorius*).—This crop has done well for two seasons. It is grown extensively both as a dye and an oil crop.

**GUÍZÓTIA OLEIFERA.**—The source of the Ramtil oil. This plant grows so readily and seeds so profusely at the Botanical Experiment Station, Salisbury, that after one crop the plants volunteered so freely that a subsequent seeding was unneces-

sary. The yield per acre is rather on the low side, although the oil content varies from 52 to 60 per cent.

**CORIANDER** (*Coriandrum sativum*).—The trials during the last two seasons have given satisfactory results, but yields on a large scale have not yet been determined. The crop presents much difficulty in harvesting.

**TREE LUCERNE** (*Medicago arborea*).—This plant, which is distinct from Tagasaste (*Cytisus proliferus*), has now been growing at the Botanical Experiment Station for several seasons, without, however, any great measure of success. The plants have not attained full size nor have they flowered. They are also very susceptible to the attacks of white ants.

**SESAMUM**.—An oil crop, and the source of Sesamy oil. Two varieties have been tried for several seasons, but although the plants grow exceedingly readily, the yield of seed has been too low to make it remunerative in this country. The white-seeded variety is earlier than the yellow-seeded, but the yields per acre were only 140 lbs. and 224 lbs. respectively.

**YAMS** (*Dioscorea batatas*).—Although these plants have grown well and have produced crops of sound tubers, they are far from giving entire satisfaction. The yield per acre is apt to be low as compared with other roots, and the tubers are frequently attacked by insect and other pests, so that their keeping qualities, for which they are renowned, are wanting here. They are receiving further trials.

**PLECHANTHUS EDULIS**.—An indigenous plant yielding a large quantity of edible tubers rather smaller than potatoes. The Shangaan natives are fond of these tubers, but they are otherwise of little value except as pig food.

**SPINELESS PRICKLY PEAR** (*Opuntia spp.*).—Two varieties have been under trial for several seasons—one from Algiers and one from Prof. Burbank of California. Neither has proved to be entirely spineless in this country, as they are reputed to be in the country of origin; nor, again, have they made the vigorous growth which characterises the native species. Although seemingly so desirable as a cattle feed for arid regions, it has many drawbacks, the most formidable of which is the tendency of the plant to revert to its original

spiny form when grown from the seeds produced. The cultivation of the plant is forbidden by law in Rhodesia.

KARROO BUSH (*Pentzia virgata*).—A plant much esteemed as a sheep fodder in the Karroo. Two small plots have survived many seasons at Salisbury, without, however, having shewn sufficient vigour to recommend their adoption for fodder purposes.

SALT BUSHES (*Atriplex spp.*).—All attempts to grow the many varieties of these useful plants have proved unsuccessful at the Botanical Experiment Station, Salisbury. They are usually regarded as favouring brak soils. On the red soil a good germination is followed by poor after-growth, and the plants readily fall victims to drought and insect pests.

SUNN HEMP (*Crotalaria juncea*).—This fibre crop has been under trial for several seasons, and has been characterised by vigorous and healthy growth, the plants attaining a height of 6 ft. Seed was planted in rows 12 ins. apart and 4 ins. distant in the rows. Samples of this fibre, together with flax and Deccan hemp (*Hibiscus cannabinus*), have been prepared for examination in Europe, but, as far as present results shew, the yield of sunn hemp fibre per acre is rather light. The sunn hemp plant is also sometimes used as a green manure crop, and is well spoken of for this purpose.



## Proposed Rhodesian Stock Breeders' Association.

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At a recent meeting of stock owners and others held at Gwelo on 21st May last during the show week, it was decided to form a Rhodesian Stock Breeders' Association. A provisional committee was there appointed, consisting of the following gentlemen, with power to add to their number:— Capt. J. C. Jesser Coope (Bulawayo), chairman; Messrs. Elliot (Gwelo), J. Austin (Que Que), C. C. Macarthur (Salisbury), Edwards (Somabula), Struthers (Victoria), Richard Walsh (Bulawayo), W. H. Gilfillan (Umvuma), Wotherspoon (Hunter's Road), H. P. Fynn (Bulawayo), H. K. Pinches, hon. secretary (Gwelo). The Director of Agriculture and Mr. Simmons (of the Agricultural Department) were elected hon. life members, and the latter *ex officio* a member of the committee. Various members of the committee have subsequently held meetings at Bulawayo and Salisbury, to which local stock owners were invited for the purpose of discussing the objects of the proposed Association, and of giving their views thereon. At the Bulawayo meeting, under the chairmanship of Mr. P. B. S. Wrey, a resolution was passed supporting the main principles of the movement and inviting the committee to draw up a draft constitution for further discussion. At the Salisbury meeting, presided over by Mr. P. H. Gresson, the same resolution was passed, but it was recommended that the question of dealing with grade stock be left open for the present, and that only pure-bred stock be dealt with.

As a result of these meetings, the committee is now engaged in drawing up a draft constitution for presentation to a public meeting at some suitable future date. In the meantime it may be of interest to our readers to know what are the objects in view.

It has been felt that with the increasing number of pure-bred stock in the country, and with the consequent increasing number of grade stock, there should be some means within the country of controlling the registration of stock, of collecting and publishing the numbers and whereabouts of such stock, and of preventing any fraudulent practice with regard to pedigrees, etc. This last-mentioned object is not a reflection on the integrity of our stock owners, but, in conjunction with the others, is merely following out the practice of all older stock countries, and tends to inspire confidence in buyers, thus improving and strengthening the industry.

At the original meeting at Gwelo the object in view was merely the registration of pure-bred and grade stock. That meeting has provoked, as it was hoped, a good deal of discussion, and has brought forward many ideas and opinions. The result is that the views of the promoters have been enlarged, and it is now thought that a Rhodesian Stock Breeders' Association, besides merely registering stock, may well take up many other matters affecting stock, such as the examination and recognition of cattle judges, the arrangement of classes at our various shows, the issue of standard points for the various breeds, and so on. Much of this work is done elsewhere by separate bodies, such as judges' associations and the like, but there seems no reason why we should not profit by the experience of the Union and include all stock matters in the work of one wide national association. This last point is important, that is to say, any such association as it is proposed to form must be a Rhodesian association; it must in no sense be local, but must belong as much to one part of the country as the other, and be controlled by people representing all parts and all sections of stock owners.

The many advantages which would arise out of the formation of an association must be apparent to all who have had the opportunity of studying the stock industry of other countries, but we may perhaps mention the chief of these advantages, namely, reliability of all pedigrees, etc., the education of the younger generation in stock matters, the advertising of our herds, uniformity of classification at shows, and the constant improvement of all stock in accordance with our needs.



Here in Rhodesia we may always register our herds in the South African Stud Book through either of the Breed Societies or Breeders' Associations in the Union. The question now arises, " Shall we continue to do this or shall we form our own Stud Book?" There are some who think we should form a Rhodesian Stud Book and act entirely independently of the Union; others again put forward good reasons for continuing to make use of the Union Stud Book for the present. Let us consider the question for a moment. The objects of a Stud Book are, briefly, three-fold:—(a) To maintain the breeding and purity of pure-bred stock by means of an authentic record of the same, (b) to form a reliable source of information for purchasers, and (c) to form an advertising medium for breeders.

The first of these objects may easily be attained by means of a Rhodesian Stud Book, but it is not so with the second and third. For some years we are likely to be importers rather than exporters of breeding stock, therefore a record dealing solely with Rhodesian cattle would not be a very comprehensive book of reference for purchasers, and even were we sellers, the advertisement obtained in such a small and unimportant volume as it would be at first would not be nearly as great as that obtained by registering our animals in a book dealing with all the stud stock of South Africa. Again, the expense of printing and publishing a Stud Book would be considerable, and it is doubtful if, while our numbers are so small, it could be done at a cost to the individual which would compare with the subscription to the South African Stud Book.

There is an impression in the minds of some that if we once become affiliated to the South African Stud Book Association we shall have great difficulty in seceding from them should we at any time desire to do so. We may state at once that there would be no difficulty at all. It would merely be necessary to copy the records out of their book into ours and we could proceed on our own account without any further trouble.

So far as the control of our own stock is concerned, it is proposed to approach the South African Association with a



view to having the Rhodesian Association affiliated to them, just as the Provincial Associations formerly were in the Union. We here, then, should receive all applications for registration, take what steps we thought necessary to satisfy ourselves that they were in order, and forward them to the South African Association for registration. The South African Stud Book Association would reserve to itself the right of veto, in order to avoid technical errors, but would otherwise accept the entries forwarded by our Society without question.

If we publish our own Stud Book and act entirely independently we shall incur much expense. We should produce a volume of little value to the general stock owners of the country, and we should have practically no more control over our own stock than we should under a system of affiliation. This last assertion may seem an exaggeration, but when it is considered that under any circumstances we should have no choice but to follow the same strict lines as all other Stud Books in order to make our work of any value, it will be seen that under affiliation or working independently our methods must be the same.

In addition to dealing with pure-bred stock, it was also proposed at Gwelo that the Breeders' Association should keep and control a register of grade heifers. By that was meant that an effort should be made to breed and keep a record of animals which should be pure-bred except for one original native or cross-bred dam. For instance, it was proposed that if a breeder bought a pure-bred registered Hereford bull and put him to native or local cows, heifers of the first cross from this union should be inspected by officers of the Association. Should any be found to possess marked Hereford characteristics they should be branded as grade Herefords generation A. Again, the progeny of these heifers by a registered Hereford bull would be similarly inspected and branded as grade Herefords generation B, or rejected as the case might be. By such means we should eventually arrive, say in six or seven generations, at a stud of Herefords which were to all intents and purposes pure-bred and acclimatised to the country. We could then turn the register into a Herd Book, and admit all the progeny of animals entered therein on proof of birth without inspection. We would point out

that there is no machinery in the Union for carrying out work of this kind, and, if done at all, it must be done independently by the Rhodesian Association. Objection has been made to the registration of grade cattle, first of all on the ground that the South African Stud Book Association are about to close their appendix section (which was practically a grade register), and that therefore presumably they found it unsatisfactory. The facts of the case are that the appendix section has been entirely successful, but that having fulfilled its object it has been merged in the Stud Book proper. Secondly, it is submitted that the work would be too complicated to carry out. In answer, we would point out that the present American Hereford Herd Book was commenced in this way some 20 odd years ago, and has been brought to a successful issue. Thirdly, it is said that such a register would imperil the position of pure-bred animals. We, however, see no reason why it should, as the very fact of describing grade animals as such would indelibly distinguish them from pure-breds, whereas to-day many grades are passed as pure-bred in the absence of proof to the contrary.

Having thus briefly stated the objects of the proposed Association, we would ask all stock owners and others to give the matter their consideration. We are asked to state that the hon. secretary of the Association, Mr. H. K. Pinches of Gwelo, will be glad to receive the names of any who would like to be associated with the movement, and in any case is prepared to answer questions on the subject. Any suggestions will be welcomed and will have the full consideration of the committee.

## Poultry Keeping in Rhodesia.

By FRANK SHEPPARD.

To those of us who have kept poultry and reared chickens to any extent in England there will appear, on taking up poultry farming in Rhodesia, many difficulties which we were not faced with at Home, and the greatest problem we have to solve is the food question, especially the feeding of young stock and laying hens. We do not find on the Rhodesian market sharps, Sussex ground oats, pea meal, bean meal, etc., with which we reared chicks with success in the Old Country. For our soft foods we have to experiment with mealie meal, bran, boiled munga, rice, etc.—I refer, of course, to chicks hand-reared in a brooder, not to those hatched under a native fowl; these we usually leave to the care of the mother hen and Providence.

Much has been written lately about the dry food system of rearing chicks, and by some writers it is said to be superior to using soft food. But opinions differ, and most probably the most suitable system for Rhodesia, as in England, will be found in combining dry and soft feeding. For our dry food we find we cannot obtain the various crushed grains we have previously used for our mixture. We have to content ourselves with crushed mealies, munga, rice, kaffir corn, rapoko, oats and wheat, to make a suitable mixture, not forgetting that the food ratio for a growing chick is one of albuminoids to three of carbo-hydrates. For the first feeds given to chicks, which should always be sprinkled with fine grit, oatmeal or some of the excellent imported chick foods should be given; the old-fashioned food of bread-crumbs and hard-boiled eggs is good, but far too much trouble when chicks are reared on a large scale. Bread and milk, not too moist, once a day will



be found beneficial to their growth. As regards green food, which should be given to chicks from the very start, Rhodesia has a great advantage over England with lucerne as a winter crop, which is the best green food for all fowls, either chopped fine or boiled in with the soft mash. The Tagasaste, or tree lucerne (*Cytisus proliferus*, var. *Palmensis*), which is only yet in the experimental stage in this country, will probably be very suitable for poultry, as it can be grown in the pens, and in time should attain a height giving excellent shade from the sun, which is essential to all poultry in this country.

We have no need here for the hot brooder so much used in colder climates, but I have found a brooder to work successfully made somewhat on the same lines as the cold brooder, used with varying success in England and America, except that I have a wire front to the inner chamber instead of glass and no diaphragms. This brooder will hold 50 chicks, but care must be taken to have good ventilation and no draught in the brooder box in which the chicks sleep at night. The youngsters can be put into this brooder straight out of the drying box of the incubator on a warm day, and if the nights are cold the brooder box should be taken out and put in a warm place for a few nights and put back after the sun has warmed up the brooder in the morning, but the chicks themselves will soon let their attendant know whether they are cold or not.

Taken on the whole the poultry-keeper in Rhodesia has a larger area of ground than the English small holder and back-yarder, which is a great advantage in rearing young stock, as with a good range the chicks thrive well and are more healthy and pick up a great deal of natural food, and although one or two may be lost through hawks and other vermin, their loss will be compensated for by the small food bill. There is practically no natural food to be found in England in winter and early spring.

The question of a suitable hard food for laying hens must have bothered those of us who intend to get as many eggs as possible from our birds. The mixture of oats and wheat in equal parts, or oats alone, so much used in England, is hardly to be obtained here. Cape oats, which have not half the body

of the New Zealand clipped oats, seem to vary considerably, but I have seen some samples here well worth a trial in a mixture with, say, equal parts of buckwheat, crushed mealies and munga. The mixtures made by some of the local merchants are not reliable, as the makers are not always able to tell in what proportion the different grains are added or whether the mixture is always made to the same standard. A mixture made on these lines is practically useless for egg production. We do hear instances of birds laying well when fed on mealies only—perhaps they do—but there is not the slightest doubt that they would lay better if fed on a food containing less carbo-hydrates.

Formerly in America wheat was held to be the best poultry food, although some breeders pinned their faith to maize; and in 1898 experiments were carried out at the Massachusetts Agricultural College at Amherst with birds fed on wheat and maize as the staples. The tests proved that not only did those fed on maize lay more eggs than the wheat-fed birds, but larger eggs and a better quality of yolk. These experiments, it must be remembered, were carried out in America, not in Rhodesia, and we must not forget that the American maize has a smaller proportion of carbo-hydrates than the Rhodesian.

In England maize is very little used except for sitting hens, and in some of the mixtures it is to be found in small proportions. As a fattening food it is not suitable, as it causes a large amount of yellow fat; it is white fatted fowls that are required for table purposes.

There is perhaps one point in favour of feeding fowls on mealies even in Rhodesia. Being of a heating nature, it tends to bring on the moult earlier in the season and improves the plumage.

I have not heard of any experiments being carried out in Rhodesia with regard to feeding laying hens on mealies, but it may be interesting to know that in Cornwall in 1902 trials were carried out under the direction of the Technical Institute Committee of the County Council and published in the Journal of the Board of Agriculture, vol. x., No. 2. Thirty pullets were taken of the same age and strain: the conditions as to



housing, runs and shelters were uniform throughout. The birds were divided into six equal pens and fed as follows:—No. 1 pen wheat, No. 2 barley, No. 3 oats, No. 4 two-thirds oats, one-third maize, No. 5 half oats, half maize, and No. 6 maize. The experiment lasted twelve months, and at the end No. 5 pen was first as regards number of eggs, No. 1 second, No. 6 third, No. 4 fourth, No. 3 fifth and No. 2 sixth. The spring and summer of this year were very wet and cold. Had it been an average year no doubt these figures would have been altered. These tests prove little that is of use to Rhodesians—still they will be of interest.

Poultry fed on grain alone do not thrive, as was proved by the trials held at the New York Experiment Station some time ago. It was also found that grain-fed pullets were slower growers and later layers than others; therefore we must find a suitable soft food for our laying hens and pullets in Rhodesia. Some of the whole grains boiled with meat and plenty of green food dried off with bran or mealie meal might be found suitable, or two parts of scalded bran to one of mealie meal (by weight), a mixture much used in America, will perhaps help to increase our egg supply. Buckwheat, one of the most useful foods for fowls, is not extensively used in England, although in France, with wheat, it is the chief poultry diet, and buckwheat meal, which is used for fattening purposes, is said to produce a very white flesh.

It is the usual system of feeding to give the soft food in the morning and hard grains at night. The soft food soon passing through the system, makes the birds energetic and lively first thing in the morning, and the grain in the evening, taking longer to digest than meal, supplies their wants during the night, especially during the long winter nights when they are liable to get hungry. There are, however, some poultry keepers who reverse their feeding, giving the grain food in the morning and the soft mash at night. With a view to determining which was the more suitable, experiments were held in, I think, 1901 at the Hatch Experiment Station of the Massachusetts Agricultural College, U.S.A. These trials shewed that neither in winter nor summer was there any very considerable difference in the number of eggs produced, but that during the winter those that received the mash in the



evening laid less eggs than the others, and although there was not a great difference in egg production, it was considered better to feed the soft mash in the morning.

It is curious how the name "rooster" for a cock bird has crept into Rhodesia. It is an American term, and hardly ever heard amongst English poultry breeders. Fowls in Rhodesia are subject to practically the same diseases as those in England, but in this country the chief trouble is liver disease, usually caused by wrong feeding, lack of exercise and scarcity of green food. If taken in time a bird is easily cured. It should be isolated and dosed with Epsom salts and fed sparingly, but a good supply of chopped green food should be given. The English poultry keeper has to be thankful he has no tampons or sand fleas to contend with, and the only disease in England that I can call to mind which Rhodesian birds are free from is frost bites, chiefly on the wattles, caused through drinking from large troughs during frosty weather. The moulting season in England is, roughly, from July to October. It will be interesting to see how imported birds take to the Rhodesian conditions after they have been in the country a year or two. In November last I imported from England two pens of birds hatched January, 1913. They have been laying ever since they arrived, and with the exception of a White Leghorn cock, they have shewn no signs of moulting yet.

The almost continual sunshine in Rhodesia is one of our greatest advantages over England as regards poultry keeping, but there are times when those of us who are breeders of white birds could very well do without it. In England there are very few really pure white birds to be seen even at the best shows. Breeding from pure coloured stock is the chief point, of course, but in Rhodesia, however good our strain is, it is practically impossible to put a really good coloured bird in the show pen in varieties such as White Wyandottes, White Leghorns or White Orpingtons, where colour counts so much from the judges' point of view. It is not white birds alone whose colour is affected by the sun; Columbian Wyandottes, Light Sussex and Rhode Island Reds soon shew the effect of continual exposure to sunshine.

We cannot expect poultry shows in this country to be run on the same lines as the Palace or Dairy Show, but there is room for a great deal of improvement in the management, as some are conducted in a manner most unsatisfactory to exhibitors. Although we have little use for an exhibition type of bird, the keen competition on the show pen greatly encourages the breeding of pure-bred stock, especially when there are classes for Rhodesian-bred birds, which I consider should be in every schedule.

The formation of the Rhodesian Poultry Association will do a great deal to raise the standard of poultry, which is at present very low; but to do this, it must receive the support of every breeder in the country, who should remember that "unity is strength." I am confident that there is a great future for poultry in this country, which, with its advantages and disadvantages, is no less suitable than England or America, or perhaps even Australia. The utility type of bird is what we want—Leghorns, Wyandottes, Rocks, Orpingtons, Rhode Island Reds and Minorcas; and when table poultry is sold by weight—but not till then—there will be a great opportunity for the fattener with Sussex, Salmon Favorelles, Game and even Dorkings. Those of us who wish to take up poultry as a hobby pure and simple might import Rhode Island Whites or a pen of the latest variety to be seen on the English shows, *i.e.*, Golden Barred Buff Rocks.

## The Proposed Orchards Inspection Ordinance.

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The Orchards Inspection Ordinance, which was introduced during the recent session of the Legislative Council, is a measure of considerable importance to fruit growers, and for the benefit of those who may not have read the Ordinance or followed the debate that took place, we propose here to deal with the main provisions of the Bill. The Ordinance, it may be stated, passed the second reading, but has not yet reached the Committee stage, but is set down for the next sitting of the Council in October purposely to give all interested ample opportunity to study the proposals contained in the Ordinance before it comes before the House again.

The Ordinance provides for the control of pests of fruit trees and gives the Administrator power to frame regulations for the carrying out of this object. Provision is made for the inspection of orchards with a view to ascertaining whether any pest is present. Should any pest be found the owner of the trees so infested may be required to take measures for its eradication or to prevent the spreading of the pest. The removal of fruit or fruit trees from orchards in which a pest has been found may be prohibited until such time as the orchard has been found to be reasonably free from the pest. The Administrator also has power to authorise the destruction, without compensation to the owner, of fruit, fruit trees or any other plant, where this is deemed to be necessary or expedient. Sub-section 8 of clause 2 provides that in the event of failure of any owner to comply with the instructions of a duly authorised official regarding treatment or destruction of fruit or trees, or the adoption of other such measures, steps necessary for the eradication of the pest may be taken and the expenses incurred recovered from the owner.

The penalty clause renders a person contravening the provisions of the Ordinance liable to a fine not exceeding £25.



At the present time there is a law providing for the examination of fruit and other trees coming into this Territory from outside, and there are also laws for the inspection of nurseries, but there is nothing in the way of control of established orchards. Some of the provisions of the Ordinance may at first sight appear somewhat stringent, but the experience of other countries shews clearly that repressive measures of the nature outlined are vitally necessary for the successful establishment of a fruit industry. Although it is recognised that there is no special danger threatening the fruit industry at the present moment, it is none the less desirable to provide for the nascent fruit industry and its future requirements, and to enable prospective fruit growers to know what protection they may look for and under what conditions they will carry on their avocation.

The greatest danger to be apprehended is in towns and villages where gardens and orchards lie close together, and where the amateur gardener grows trees for pleasure and not for profit, and is consequently more liable to neglect his trees than the man whose living depends upon the health and vigour of his orchards. The measure is essentially a protective one, and fruit growers will realise it is designed for their particular benefit.

The scope of the powers vested in the Administrator, it will be noticed, is limited, and the provisions of the Ordinance are only to be applied when trees are not *reasonably* free from disease, as, of course, it is recognised that absolute freedom from disease is not practicable.

As stated, the Ordinance provides for the compulsory inspection and cleansing of orchards. This provision may no doubt be regarded as an interference with the rights of the private individual, but it is to be remembered that the aim is the protection of his neighbour and the public in general, whose interests are endangered, and only incidentally the benefit of the individual in spite of his own carelessness or ignorance. At the same time it may be stated that this is only a small part of the measures adopted in other countries. In Australia, for instance, the compulsory cleansing of orchards is conducted in a very much more autocratic manner. Granted

that the industry here has not yet approached the stage of development it has in countries like America and Australia, still the provision is a very necessary one if control is to be effective and a flourishing fruit industry established. It is, therefore, to be hoped that the principle will be upheld and the proposed Ordinance enacted in due course.

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### Movement of Cattle from Drought Areas.

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The Railway Administration has agreed to grant, from any station in Matabeleland, half rates on the outward journey and free transport on the return to assist in the conveyance of cattle to fresh pasturage during the present drought in Matabeleland. The conditions are as follows:—

- (a) The consignor (who must be a *bona fide* farmer) must sign a declaration that the stock is being moved from his farm owing to want of pasturage.
- (b) The stock must not be moved further than is reasonably necessary.
- (c) On return of the same cattle to the original forwarding station within 12 months, a declaration must be furnished to the effect that the stock is the same as that originally forwarded, and is being returned after being away for change of pasturage, which declaration must be countersigned by a Magistrate, Civil Commissioner, Native Commissioner, or Government Cattle Inspector.

## The Agricultural Outlook.

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Farmers everywhere are breaking up their lands in preparation for the new crop. From what can be gathered, they appear more and more to be realising the advantages accruing from early ploughing, and with the growing practice of cutting the mealie stalks for forage and with labour fairly plentiful, the acreage under crops next year will far exceed anything yet attained.

The maize crop in Mashonaland was rather in excess of expectations, and will, it is considered, be sufficient to meet the requirements of the Territory and leave something over. The grazing in general is, for the time of the year, good. Conditions are not so favourable in Matabeleland, where the paucity of the rainfall more seriously affected crops and water supplies, though the veld is generally abundant. Farmers, however, are, as far as stock is concerned, now in a better position to meet the vagaries of the seasons, boreholes for the watering of cattle and silos for feeding now being in evidence in many parts. It is not expected that the natives will require Government assistance in the matter of feeding this year, the late crops, which fortunately escaped the frost, being considered sufficiently abundant to tide over the dry season.

The tobacco crop is now coming into the Warehouse, and will be re-ordered by machine, when the latter is ready. The Tobacco Planters' Co-operative Society have thought it necessary to draw attention to the quality of some of the leaf being sent in, which it is stated is so inferior as to be not worth handling. At the present time it looks as if we must seek abroad for the disposal of our leaf, and we are sure that growers will realise that it is futile to grow tobacco of so poor a quality.

There have been renewed outbreaks of African Coast Fever in the vicinity of Salisbury during the past few months, but happily they have been kept well in hand and the mortality is low.



## Veterinary Report.

May, 1914.

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### SALISBURY.

**AFRICAN COAST FEVER.**—*Fresh Outbreaks.*—An outbreak occurred on the 5th May at the Epworth Mission, which adjoins the Hatfield Estate; a death was reported and Coast Fever diagnosed. Over 700 cattle were running on the mission, and the two herds grazing on the Hatfield boundary were found to be grossly infected. During the month 75 animals were destroyed. Five-day dipping has been put in force, and the three farms are being fenced. On the 18th May three animals were reported sick at Bluff Hill farm, and on inspection Coast Fever was suspected, which was confirmed by microscopic examination of smears. On the next day three more cases were diagnosed. All the infected animals were destroyed, and five-day dipping instituted.

*Existing Outbreaks.*—No cases occurred at the M.T.C. or Salisbury.

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### BULAWAYO.

**AFRICAN COAST FEVER.**—No outbreaks or cases of the disease.

**MALLEIN TEST.**—The following animals were tested with mallein and found free from glanders (Plumtree and Gwanda included):—Horses, 124; mules, 35; donkeys, 247.

**IMPORTATIONS.**—From England: Heifers, 21; bulls, 22. From the Union of South Africa: Horses, 125; mules, 35; donkeys, 156; heifers, 723; bulls, 98; sheep and goats, 4,455; pigs 55. From Northern Rhodesia: Oxen, 20.

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UMTALI.

AFRICAN COAST FEVER.—*Existing Outbreaks.*—Two head were destroyed at N'Odzi, bringing the total mortality to date to 147. Mabonda—No further cases. One bull was destroyed in the infected herd at Penhalonga.

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## GWELO.

MALLEIN TEST.—Four horses were tested with mallein and found free from glanders.

HORSE-SICKNESS.—Six horses were reported to have died from this disease.

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## GENERAL.

Cases of gallsickness and redwater have been reported from Gatooma, Makwiro, Salisbury and Enterprise.

Trypanosomiasis reported from Hartley and Gatooma. A large percentage of the treated animals have returned to work.

All other districts reported free from contagious disease.

C. R. EDMONDS,

Acting Chief Veterinary Surgeon.

## Veterinary Report.

June, 1914.

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### SALISBURY.

AFRICAN COAST FEVER.—No fresh outbreaks. Ten cases occurred during the month—six at Epworth, two at M.T.C. and two at Bluff Hill. All the animals were destroyed.

MALLEIN TEST.—One horse tested for glanders and found healthy.

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### BULAWAYO.

AFRICAN COAST FEVER.—No outbreaks or cases.

TUBERCULOSIS.—Thirty-two animals were tested, two of which shewed suspicious reactions, and are being quarantined pending further test.

MALLEIN TEST.—The following animals were tested with mallein and found free from glanders (Plumtree and Gwanda included):—Horses, 229; mules, 52; donkeys, 351.

IMPORTATIONS.—From England: Heifers, 6. From the Union of South Africa: Horses, 230; mules, 52; donkeys, 129; heifers, 373; bulls, 93; ostriches, 20; sheep and goats, 5,419; pigs, 8. From Northern Rhodesia: Oxen 20.

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### UMTALI.

AFRICAN COAST FEVER.—No cases of this disease occurred during the month.



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GWELO.

HORSE-SICKNESS.—Two horses and one mule reported having died from this disease.

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## GENERAL.

Animals died from gallsickness and redwater at Marandellas, Umtali and Lalapanzi.

Fresh cases of Trypanosomiasis occurred at Hartley and Gatooma. Very favourable reports were received of the treatment of "fly-struck" cattle. In one instance 260 were exposed to risk of infection; of these, 62 became infected and were treated, of which number 35 have been returned to work. No deaths have occurred to date. In another case 150 were infected and two died; the remainder were treated and recovered rapidly, no further deaths occurring.

Other districts reported free from disease.

C. R. EDMONDS,

Acting Chief Veterinary Surgeon.

# Garden Calendar.

August and September.

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By N. L. KAYE-EDDIE.

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## THE FLOWER GARDEN.

*August.*—This is a busy month, and the soil should be kept in good tilth. Roses, shrubs and ornamental trees may be planted. All seeds may now be sown. Marguerite Carnations sown now will flower by the end of the year. Cuttings of carnations and other perennials should be planted either in the open ground or in boxes, using loose and well-decomposed soil for the latter, taking care that they are well drained, or the success will be small.

*September.*—Although our spring advances with this month, rains are very uncertain and usually scarce, but in spite of circumstances plants now grow with very little encouragement. Perennials and shrubs should be well attended to, especially those which flower early; the soil should be kept well stirred around the stems, and they should be watered if necessary.

Practically all flower seeds may now be sown in boxes, nursery beds, or in the open ground where they are to be grown. Nursery beds are perhaps preferable, as a great deal of watering may have to be resorted to on account of late rains. All annuals sown in July should now be ready for transplanting; should these be few, and a larger show of flowers desired, the heads may be pinched out after planting, which makes the plant spread out more and become bushy. Shrub and ornamental tree seeds should be sown now if desired for planting out during the rainy season, and may be sown in the open; if it is desired to hasten them they should be planted in boxes

and covered with glass, and placed in a sunny position sheltered from the winds. If summer bulbs have not already been replanted, this should be done at once; they sprout as the weather becomes warmer, and, if allowed to do this before planting, the bulb loses much of its vigour. It must be borne in mind that all bulbs that cluster, if divided, produce better blooms, and the plants have a better appearance than the old cluster, which has a lot of decayed matter and generally a ragged appearance; this also applies to those perennials which may be increased by division of roots.

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### KITCHEN GARDEN.

*August.*—All vegetable seeds may now be planted. Those having but a limited supply of water would be wise to sow in boxes, transplanting when large enough. The seed beds require careful preparation; they should be well raked up and laid out in long narrow rows in order to facilitate watering. The tops of the beds should be levelled as near as possible, and when sown, covered over with a thin layer of straw or grass, which will prevent the seeds being washed out when watering and the soil from caking.

*September.*—Most seeds may now be sown, though there is risk of losses from want of rain. Watering, of course, can be resorted to. Marrows, pumpkin, melon, cucumber, and peas may be planted in the field after the first rains. Tomatoes that have been sown earlier should be planted out, and these as they come on should be staked.



## Market Reports.

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The produce markets at Bulawayo and Salisbury are well supplied with all lines.

A number of stock sales has been held during the past two months, good prices generally being realised. At Bulawayo during the Show Mr. A. G. Hay disposed of some 592 head for a total of £5,609. Mr. Hull's fine pedigree Short-horn bull was sold for £155 and the same owner's pure-bred young Red Lincoln bulls, eleven months old, realised from £47 10s. to £62 10s., while a graded bull fetched £36. The pedigree Hereford bull "Spark" was sold for £100, and Mr. English's well-known herd of dairy cows were disposed of at prices varying from £10 to £33. Heifers, twelve months old, fetched from £8 to £13 10s. The bidding was very spirited and brisk, and the competition for good stock was very keen. Other dairy cows were sold at from £11 10s. to £16 10s.; Colonial heifers, ordinary breeding stock, twelve months old to two teeth, were well sought after at £5 12s. 6d. to £8 10s.; picked Africander cows sold at £15; Africander heifers, £12 to £13 5s. Mr. Woods' Aberdeen Angus steers and Mr. Hull's slaughter cattle were the outstanding features of the sale. There was a good demand for locally bred stock, Mr. Hull's cows fetching from £10 10s. to £28, and other local heifers and cows fetching from £6 10s. to £22 10s. The only Ayrshire bull offered was secured by Mr. Jock Campbell of Gwelo. Young Friesland bulls realised from £7 10s. to £14. The majority of the stock was secured by the Midlands, Gwanda, Nyamandhlovu and Salisbury buyers.

Messrs. Boggie & Co., in conjunction with Mr. A. E. White, held their mid-winter sale of cattle in Gwelo on the 17th and 18th June. Upwards of 2,000 head of cattle were in the sale yards, and these came from Matopos on one side to Marandellas on the other. Messrs. Boggie & Co.'s extensive sale yards were filled early on Wednesday morning, and buyers

attended from all parts of Rhodesia. As usual, the principal demand was for slaughter stock, the prices realised being from 30s. to 35s. per 100 lbs. Trek oxen were also in fair demand, especially young animals, which realised from £7 to £10. A feature of the sale was the large number of Colonial breeding stock. Probably owing to the dry season, and an anticipated scarcity of grass, the demand for heifers was not so good as expected. The highest price realised was £18 for some young animals that had been in the country for six months. Heifers introduced recently realised from £6 to £10 10s. A large number were unsold. Dairy cattle, as usual, were in keen requisition, but there were few good milch cows on the market. There was quite a large number of old cows, some with calves at foot. These animals realised poor prices and were probably purchased for slaughter purposes for the mines. Merino sheep (wethers) fetched 25s.; native sheep, 9s. There was no demand for horses, mules or donkeys. Turkeys were knocked down for 10s. to 12s. each. The sale occupied two days.

Mr. G. W. Pott held a sale at Gwanda on the 20th June, when the following prices were realised:—Breeding stock, mostly with calves at foot, £8 per head; heifers, twelve months to two years old, £4 5s. to £7 10s. each; good class cows, £17 10s. each; slaughter oxen, £8 to £11 10s. each; young oxen, £6 10s. to £7 10s. each; bulls, £20 to £30 each.

At Hartley at a sale conducted by Mr. J. G. Hunt and Mr. J. de L. Nimmo the following prices were realised:—Oxen, from £6 to £9 5s.; heifers, from £7 10s. to £12 10s.; cows, from £7 to £19 10s.

Messrs. Whitfield & Co. held a sale on behalf of the Rhodesia Lands at Jumbo on the 18th June, at which bulls fetched £14 to £20; bullocks, £7; Angoni cows, £7 to £8; and Angoni cows in calf, £7 10s. to £8 10s. The quality of the stock offered for sale was not very good.

| Article.                           | Johannesburg. | Kimberley. | Bulawayo.      | Salisbury. |
|------------------------------------|---------------|------------|----------------|------------|
| Barley, 150 lbs. -                 | 8/6 10/6      | —          | —              | 25/0 30/0  |
| Beans, 203 lbs. -                  | 15/0 32/6     | —          | —              | 12/6 20/0  |
| Boer Meal, unsifted,<br>200 lbs. - | —             | —          | 39/0 41/0      | 37/6       |
| Bran, wheaten, 100 lbs. -          | 7/6 8/3       | —          | —              | 16/0       |
| Flour, 100 lbs. -                  | —             | —          | 25/6 26/0      | 19/0 22/0  |
| „ Colonial, 100 lbs. -             | —             | —          | 22/6 23/6      | —          |
| Forage, 100 lbs. -                 | 5/3 5/6       | —          | 9/6 10/6       | 8/6 10/0   |
| „ Colonial Oat -                   | —             | —          | —              | —          |
| Hay -                              | Bale. 8d. 1/- | —          | Ton. 60/0 65/0 | Ton. —     |
| Kaffir Corn, 200 lbs. -            | 8/3 10/6      | 10/0 12/0  | 16/0 17/0      | 12/6 15/0  |
| Manna, 100 lbs. -                  | 4/3 4/9       | —          | —              | —          |
| Mealies, S.A. White,<br>203 lbs. - | 7/6 8/4       | 9/6 10/0   | 12/9 13/0      | 8/6 9/0    |
| Mealies, Yellow, 203 lbs. -        | 7/6 8/9       | 9/0 10/0   | 12/6 13/0      | —          |
| Mealie Meal, White,<br>183 lbs. -  | —             | —          | —              | 8/6 9/0    |
| Munga, 200 lbs. -                  | —             | —          | —              | 12/6 15/0  |
| Monkey Nuts, bag, 83 lbs. -        | 8/6 8/9       | —          | 10/6 11/6      | 8/0        |
| Oats, 150 lbs. -                   | 8/6           | —          | —              | 21/0 21/6  |
| Onions, 120 lbs. -                 | 9/6 10/6      | 6/0 10/0   | —              | 22/6       |
| Peas, 200 lbs. -                   | 18/0 18/6     | —          | —              | 20/0       |
| Potatoes, new, 150 lbs. -          | 13/0 16/0     | 8/0 16/0   | 17/0 18/0      | 13/6 15/0  |
| „ old, 150 lbs. -                  | 7/0 11/0      | —          | —              | —          |
| Rapoko -                           | —             | —          | —              | 9/6        |
| Rye, 200 lbs. -                    | 16/9 17/9     | —          | —              | —          |
| Salt, 200 lbs. -                   | 4/4 4/6       | —          | 10/0 11/0      | 11/0 12/0  |
| Wheat, 203 lbs. -                  | 21/0 23/6     | —          | —              | —          |
| Butter, local, per lb. -           | 1/0 1/2½      | 1/2 1/4    | 1/3 1/6        | 2/0 2/3    |
| Eggs, local, per dozen -           | 1/0 1/2       | 1/3 2/0    | 2/0 2/6        | 3/0        |
| Ducks, each -                      | 1/9 3/0       | 2/6 3/3    | —              | 3/6 4/6    |
| Fowls, each -                      | 1/6 2/6       | 1/1 2/3    | 1/0 1/3        | 2/6 4/6    |
| Geese, each -                      | 2/9 3/9       | —          | —              | 7/6 9/0    |
| Turkeys, cocks, each -             | 3/9 13/0      | —          | —              | 12/6 14/0  |

## LIVE STOCK.

|                              |             |   |               |           |
|------------------------------|-------------|---|---------------|-----------|
| Slaughter Cattle, 100 lbs. - | 30/0        | — | 35/0 37/6     | 37/6 40/0 |
| Trek Oxen, trained -         | £7/10 £8/10 | — | £7/5 £11      | £10 £12   |
| Local Cows, milk -           | £7/10 £8    | — | £17/10 £30/10 | —         |
| Dairy Cows -                 | —           | — | £20 £32       | £25 £30   |
| Native Cows -                | —           | — | —             | £9 £10    |
| Heifers, Colonial -          | £4 £5       | — | £8 £17        | £8 £9     |
| „ Native -                   | —           | — | —             | £6 £8     |
| Pigs, live weight -          | 2¾d. 4½d.   | — | 4d. 5d.       | 4½d.      |
| Horses, riding, salted -     | —           | — | —             | £35 £40   |
| „ „ unsalted -               | £20 £30     | — | £15 £35       | £25 £30   |
| Mules, inoculated -          | £20 £25     | — | £30 £40       | £30       |
| Donkeys, geldings -          | £4 £4/10    | — | £6/10 £7/10   | £5 £7     |
| „ mares -                    | £5 £6       | — | £8/10 £10/10  | £6 £7     |
| Goats -                      | 10/0 12/6   | — | 10/0 15/0     | 12/6 15/0 |
| Persian Ewes -               | —           | — | 20/0 21/0     | 20/0 22/6 |
| Cross-bred Ewes -            | —           | — | —             | 17/6 £1   |
| Sheep, slaughter (good) -    | 10/6 13/6   | — | 23/6 26/0     | 22/6 25/0 |



# Lane's Produce Mart, Port Elizabeth.

10TH JULY, 1914.

WOOL.—There is no change to report in the market. London sales opened yesterday, and our cable states that there is no change in the market. This news is more or less disappointing, as we certainly anticipated a small advance, but should not be surprised to see same firm up before the end of the London sales.

MOHAIR.—A fair amount of business has been done in super clips of firsts at 11d. to 11 $\frac{1}{4}$ d., and for super kids at from 24d. to 25d. Ordinary hair continues to sell at 10 $\frac{1}{2}$ d. to 10 $\frac{3}{4}$ d. and occasionally up to 11d. Mixed hair is selling freely at prices ranging from 10 $\frac{3}{4}$ d. to 11 $\frac{1}{2}$ d., but of course it is only for the best clips that 11 $\frac{1}{2}$ d. is obtained. Any super clips that you may be able to buy to sell at 11d., we advise you to send down as soon as possible.

Sheepskins, sound, are fetching 7 $\frac{1}{4}$ d. per lb., and damaged 6 $\frac{1}{4}$ d. per lb. Goatskins, prime salted, 3 $\frac{1}{2}$  lbs. and under, 13 $\frac{1}{4}$ d. per lb. Hides, sun-dried, 13 $\frac{1}{4}$ d. per lb., less 1d. per lb. for damages; dry salted, 11 $\frac{1}{4}$ d. per lb.

## Schedule

GIVING A COMPARISON OF LAST SEASON'S (1913-14)  
RAINFALL WITH THE AVERAGE FROM STATIONS  
OF NOT LESS THAN FIVE YEARS' DURATION.

### MASHONALAND.

| Station.               | Average to<br>June, 1913. | July, 1913, to<br>April, 1914. | Difference.           |
|------------------------|---------------------------|--------------------------------|-----------------------|
| Chishawasha -          | 36·96                     | 25·86                          | - 11·10               |
| Driefontein, Charter - | 27·04                     | 17·30                          | - 9·74                |
| Enkeldoorn -           | 26·69                     | 18·71                          | - 7·98                |
| Gutu -                 | 26·36                     | 22·43                          | - 3·93                |
| Inyanga -              | 36·46                     | 21·77                          | - 14·69               |
| Monte Casino -         | 31·88                     | 24·59                          | - 7·29                |
| Marandellas -          | 35·96                     | 32·03                          | - 3·93                |
| Melsetter -            | 44·18                     | 40·91                          | - 3·27                |
| Mount Darwin -         | 27·62                     | 18·96                          | - 8·66                |
| Mrewa -                | 34·33                     | Returns<br>incomplete          | Returns<br>incomplete |
| Rusape -               | 30·15                     | 27·43                          | - 2·72                |
| Salisbury -            | 32·21                     | 27·60                          | - 4·60                |
| Sinoia -               | 30·28                     | Returns<br>incomplete          | Returns<br>incomplete |
| Umtali -               | 32·31                     | 21·36                          | - 10·95               |
| Utopia -               | 31·89                     | 24·30                          | - 7·59                |
| Victoria -             | 24·61                     | 16·96                          | - 7·65                |
| Westridge, Salisbury - | 29·81                     | 21·72                          | - 8·09                |
| The Range, Charter -   | 28·52                     | 20·88                          | - 7·64                |

### MATABELELAND.

|                      |       |       |         |
|----------------------|-------|-------|---------|
| Bulawayo -           | 23·09 | 15·65 | - 7·44  |
| Empandeni -          | 21·50 | 9·49  | - 12·01 |
| Filabusi -           | 21·88 | 14·58 | - 7·30  |
| Fort Rixon -         | 19·94 | 12·33 | - 7·61  |
| Gwanda -             | 18·89 | 12·44 | - 6·45  |
| Gwelo -              | 24·11 | 19·71 | - 4·40  |
| Hope Fountain -      | 24·96 | 19·20 | - 5·76  |
| Matopo Mission -     | 27·34 | 14·58 | - 12·76 |
| Rhodes Matopo Park - | 23·33 | 11·12 | - 12·21 |
| Selukwe -            | 38·68 | 32·02 | - 6·66  |
| Tuli -               | 13·39 | 17·55 | + 4·16  |

# Weather Bureau.

## TEMPERATURES.

| STATION                               | MAY          |              | JUNE         |              |
|---------------------------------------|--------------|--------------|--------------|--------------|
|                                       | Mean<br>Max. | Mean<br>Min. | Mean<br>Max. | Mean<br>Min. |
| MASHONALAND—                          |              |              |              |              |
| Hartley, Gatooma ...                  | 80·8         | 50·5         | 76·8         | 41·5         |
| „ Giant Mine ...                      | 79·3         | 52·4         | 75·1         | 48·6         |
| „ Hallingbury Farm ...                | 75·4         | 46·1         | 67·4         | 44·0         |
| Lomagundi, Eldorado Mine ...          | 81·9         | 52·1         | 81·0         | 47·8         |
| „ Kanyemba ...                        | —            | —            | —            | —            |
| „ Sinoia ...                          | —            | —            | —            | —            |
| „ Sipolilo ...                        | —            | —            | —            | —            |
| Makoni, River Junction ...            | —            | —            | —            | —            |
| Mazoe, Shamva Mine ...                | 76·4         | 52·4         | 75·1         | 48·2         |
| Melsetter ...                         | 69·2         | 46·9         | 66·3         | 44·4         |
| „ Mount Selinda ...                   | —            | —            | —            | —            |
| „ Vermont ...                         | —            | —            | —            | —            |
| Salisbury, Agricultural Laborat'y ... | —            | —            | —            | —            |
| „ Chishawasha ...                     | 74·9         | 47·0         | 72·2         | 44·9         |
| „ The Gaol... ...                     | 76·1         | 48·8         | 71·9         | 44·9         |
| Umtali, Chiconga's Location ...       | 75·0         | 50·5         | 71·3         | 47·6         |
| „ Public School ...                   | —            | —            | —            | —            |
| Victoria ...                          | 75·9         | 49·1         | 71·4         | 45·8         |
| MATABELAND—                           |              |              |              |              |
| Bulawayo, Essexvale ...               | 79·0         | 41·4         | 74·2         | 45·1         |
| „ Observatory ...                     | —            | —            | —            | —            |
| „ Rhodes Matopo Park... ...           | 78·6         | 50·8         | 74·0         | 45·2         |
| Gwelo, The Gaol ...                   | 74·5         | 48·5         | 70·6         | 45·1         |
| Mangwe, Empandeni ...                 | 80·0         | 34·2         | 76·2         | —            |
| Tuli ...                              | 82·8         | 53·6         | 77·8         | 47·2         |
| Wankie, The Hospital ...              | 86·9         | 59·5         | 84·7         | 54·81        |
| Victoria Falls ...                    | —            | —            | —            | —            |

## RAINFALL.

| STATION              | May  | June |
|----------------------|------|------|
| MASHONALAND :        |      |      |
| Charter—             |      |      |
| Driefontein ...      | 0·27 | 0·08 |
| Enkeldoorn ...       | —    | —    |
| Grootfontein ...     | —    | —    |
| Marshbrook ...       | —    | —    |
| The Range ...        | 0·08 | 0·12 |
| Riversdale ...       | —    | —    |
| Umvuma (Railway) ... | 0·64 | —    |



## RAINFALL—(Continued).

| STATION                   |     |     |     | May  | June |
|---------------------------|-----|-----|-----|------|------|
| MASHONALAND—(Continued)   |     |     |     |      |      |
| Hartley—                  |     |     |     |      |      |
| Ardgowan                  | ... | ... | ... | —    | —    |
| Battlefields (Railway)    | ... | ... | ... | —    | —    |
| Beatrice Mine             | ... | ... | ... | —    | —    |
| Carnock Farm              | ... | ... | ... | Nil  | 0·13 |
| Norton Siding             | ... | ... | ... | Nil  | 0·10 |
| Elvington                 | ... | ... | ... | Nil  | 0·02 |
| Franceys                  | ... | ... | ... | —    | —    |
| Gatooma                   | ... | ... | ... | —    | —    |
| Gatooma (Railway)         | ... | ... | ... | —    | —    |
| Giant Mine                | ... | ... | ... | —    | —    |
| Gowerlands                | ... | ... | ... | Nil  | 0·03 |
| Hallingbury               | ... | ... | ... | —    | —    |
| Hartley (Railway)         | ... | ... | ... | —    | —    |
| M'pofhoe                  | ... | ... | ... | —    | —    |
| "Jenkinstown"             | ... | ... | ... | Nil  | 0·12 |
| Makwiro                   | ... | ... | ... | —    | —    |
| Shagari                   | ... | ... | ... | 0·02 | 0·15 |
| "Stoneygate"              | ... | ... | ... | —    | —    |
| Lomagundi—                |     |     |     |      |      |
| Banket Junction (Railway) | ... | ... | ... | —    | —    |
| Darwendale                | ... | ... | ... | 0·02 | —    |
| Duxbury Farm              | ... | ... | ... | 0·38 | —    |
| Eldorado Mine             | ... | ... | ... | 0·34 | 0·06 |
| „ (Railway)               | ... | ... | ... | 0·34 | —    |
| Golden Kopje Mine         | ... | ... | ... | —    | —    |
| Kanyemba                  | ... | ... | ... | —    | —    |
| Longmead                  | ... | ... | ... | 0·43 | 0·07 |
| Palm Tree Farm            | ... | ... | ... | 1·54 | Nil  |
| Sinoia                    | ... | ... | ... | —    | —    |
| Sipolilo                  | ... | ... | ... | —    | —    |
| Umvukwe Ranche            | ... | ... | ... | —    | —    |
| Makoni—                   |     |     |     |      |      |
| Chimbi Source             | ... | ... | ... | Nil  | 0·04 |
| Eagle's Nest              | ... | ... | ... | Nil  | 0·17 |
| Ellavale                  | ... | ... | ... | 0·05 | 0·80 |
| Inyanga                   | ... | ... | ... | —    | —    |
| Mona                      | ... | ... | ... | —    | —    |
| Monte Cassino Mission     | ... | ... | ... | Nil  | 0·46 |
| Odzi (Railway)            | ... | ... | ... | 0·35 | 0·93 |
| River Junction            | ... | ... | ... | —    | —    |
| Rusape (Railway)          | ... | ... | ... | —    | —    |
| Springs                   | ... | ... | ... | 0·21 | 0·36 |
| St. Trias' Hill           | ... | ... | ... | 0·10 | 0·78 |
| York Farm                 | ... | ... | ... | —    | —    |
| Mangwendi—                |     |     |     |      |      |
| Bonongwe                  | ... | ... | ... | —    | —    |
| Glen Somerset             | ... | ... | ... | 0·43 | 0·08 |
| Land Settlement Farm      | ... | ... | ... | —    | —    |
| Macheke (Railway)         | ... | ... | ... | Nil  | 1·04 |
| Marandellas               | ... | ... | ... | —    | —    |

## RAINFALL—(Continued).

| STATION                           |     |     |     | May  | June |
|-----------------------------------|-----|-----|-----|------|------|
| MASHONALAND—(Continued)           |     |     |     |      |      |
| Mangwendi (Continued)             |     |     |     |      |      |
| Marandellas (Railway)             | ... | ... | ... | —    | —    |
| Mrewa                             | ... | ... | ... | —    | —    |
| Mungo                             | ... | ... | ... | —    | —    |
| Rusawi Outspan                    | ... | ... | ... | —    | —    |
| Selous Nek                        | ... | ... | ... | —    | —    |
| Tweedjan                          | ... | ... | ... | —    | —    |
| Mazoe—                            |     |     |     |      |      |
| Avonduur                          | ... | ... | ... | —    | —    |
| Bindura                           | ... | ... | ... | —    | —    |
| Bindura (Railway)                 | ... | ... | ... | —    | —    |
| Ceres                             | ... | ... | ... | —    | 0·22 |
| Chipoli                           | ... | ... | ... | 0·69 | —    |
| Claverhill                        | ... | ... | ... | —    | 0·88 |
| Darwin                            | ... | ... | ... | 0·45 | Nil  |
| Dunmaglas                         | ... | ... | ... | —    | —    |
| Laguaha                           | ... | ... | ... | 0·83 | —    |
| Lowdale                           | ... | ... | ... | —    | —    |
| Mazoe                             | ... | ... | ... | —    | —    |
| Mguta Valley                      | ... | ... | ... | 0·37 | 0·08 |
| Omeath                            | ... | ... | ... | —    | —    |
| Ruia                              | ... | ... | ... | —    | —    |
| Shamva                            | ... | ... | ... | —    | —    |
| „ Mine                            | ... | ... | ... | 0·89 | Nil  |
| Sunnyside                         | ... | ... | ... | —    | —    |
| Teign                             | ... | ... | ... | 0·42 | 0·10 |
| Umvukwe Flats                     | ... | ... | ... | —    | —    |
| Waterfall Farm                    | ... | ... | ... | —    | —    |
| Melsetter—                        |     |     |     |      |      |
| Chikone                           | ... | ... | ... | 0·84 | 0·71 |
| Chipinga                          | ... | ... | ... | 0·47 | 0·84 |
| Helvetia                          | ... | ... | ... | 1·22 | 0·91 |
| Melsetter                         | ... | ... | ... | 1·54 | 0·89 |
| Mount Selinda                     | ... | ... | ... | —    | —    |
| Mutambara Mission                 | ... | ... | ... | 0·97 | —    |
| Pasture                           | ... | ... | ... | 0·18 | —    |
| Tom's Hope                        | ... | ... | ... | 0·62 | 0·50 |
| Vermont                           | ... | ... | ... | —    | 2·29 |
| Salisbury—                        |     |     |     |      |      |
| Avondale                          | ... | ... | ... | —    | 0·29 |
| Brookmead                         | ... | ... | ... | —    | —    |
| Chishawasha                       | ... | ... | ... | Nil  | 0·85 |
| Cleveland Reservoir               | ... | ... | ... | Nil  | 0·57 |
| Convent                           | ... | ... | ... | —    | —    |
| Goromonzi                         | ... | ... | ... | —    | —    |
| Gwibi                             | ... | ... | ... | —    | —    |
| Lilfordia                         | ... | ... | ... | —    | —    |
| Meadows                           | ... | ... | ... | —    | —    |
| Salisbury Agricultural Laboratory | ... | ... | ... | —    | —    |
| „ (Club)                          | ... | ... | ... | —    | 0·55 |
| „ (Gaol)                          | ... | ... | ... | Nil  | 0·66 |

RAINFALL (*Continued*).

| STATION                 |     |     |     | May  | June |
|-------------------------|-----|-----|-----|------|------|
| MASHONALAND—(Continued) |     |     |     |      |      |
| Salisbury (Continued)   |     |     |     |      |      |
| Salisbury (Railway)     | ... | ... | ... | —    | —    |
| Sebastopol              | ... | ... | ... | —    | —    |
| Selby                   | ... | ... | ... | 0·30 | —    |
| Westridge               | ... | ... | ... | —    | —    |
| Umtali—                 |     |     |     |      |      |
| Chiconga's Location     | ... | ... | ... | 0·39 | 0·82 |
| Hanyanya (Bikita)       | ... | ... | ... | —    | —    |
| Odzani                  | ... | ... | ... | 0·01 | 1·43 |
| Penhalonga              | ... | ... | ... | 0·60 | 2·59 |
| Premier Estate          | ... | ... | ... | Nil  | 0·60 |
| Public School           | ... | ... | ... | —    | —    |
| Stralsund               | ... | ... | ... | 0·54 | 0·90 |
| Summerfield             | ... | ... | ... | —    | —    |
| Umtali (Railway)        | ... | ... | ... | 0·05 | —    |
| Victoria—               |     |     |     |      |      |
| Chibi                   | ... | ... | ... | 0·29 | —    |
| Chilimanzi              | ... | ... | ... | —    | —    |
| Chingombe               | ... | ... | ... | 0·35 | Nil  |
| Chiredzi Ranche, Ndanga | ... | ... | ... | 0·40 | 0·10 |
| Clipsham                | ... | ... | ... | 0·52 | 0·13 |
| Gokomere                | ... | ... | ... | 0·43 | 0·21 |
| Gutu                    | ... | ... | ... | 0·36 | —    |
| Makorsi River Ranche    | ... | ... | ... | 1·14 | 0·11 |
| Marthadale              | ... | ... | ... | 1·07 | 0·15 |
| Morgenster              | ... | ... | ... | 0·52 | 0·38 |
| Noeldale                | ... | ... | ... | —    | —    |
| Pamushana               | ... | ... | ... | 1·32 | 0·27 |
| Silver Oaks             | ... | ... | ... | 0·18 | —    |
| Victoria                | ... | ... | ... | 0·16 | 0·15 |
| MATABELELAND :          |     |     |     |      |      |
| Belingwe—               |     |     |     |      |      |
| Anglo-French Block      | ... | ... | ... | —    | —    |
| Filabusi                | ... | ... | ... | 0·10 | Nil  |
| Fort Rixon              | ... | ... | ... | —    | —    |
| Infiningwe              | ... | ... | ... | 0·28 | Nil  |
| Insiza (Railway)        | ... | ... | ... | —    | —    |
| Shangani (Railway)      | ... | ... | ... | —    | —    |
| Tamba                   | ... | ... | ... | 0·15 | —    |
| Thornville              | ... | ... | ... | —    | —    |
| Bubi—                   |     |     |     |      |      |
| Inyati                  | ... | ... | ... | —    | —    |
| Leighton                | ... | ... | ... | —    | —    |
| Lochard Experiment Farm | ... | ... | ... | 0·15 | Nil  |
| Bulalima—               |     |     |     |      |      |
| Figtree                 | ... | ... | ... | —    | —    |
| Mholi (late Magot)      | ... | ... | ... | —    | —    |
| Marula                  | ... | ... | ... | —    | —    |
| Solusi                  | ... | ... | ... | —    | —    |
| Syringa                 | ... | ... | ... | —    | —    |



RAINFALL (*Continued*).

| STATION                     |     |     |     | May  | June |
|-----------------------------|-----|-----|-----|------|------|
| MATABELELAND—(Continued)    |     |     |     |      |      |
| Bulawayo—                   |     |     |     |      |      |
| Balla Balla (Railway)       | ... | ... | ... | —    | —    |
| Bembesi (Railway)           | ... | ... | ... | —    | —    |
| Braemar                     | ... | ... | ... | —    | —    |
| Essexvale                   | ... | ... | ... | —    | —    |
| Gwaai (Railway)             | ... | ... | ... | 2·70 | —    |
| Heany Junction (Railway)    | ... | ... | ... | —    | —    |
| Hope Fountain               | ... | ... | ... | —    | —    |
| Imbesu Kraal                | ... | ... | ... | —    | —    |
| Keendale                    | ... | ... | ... | Nil  | 0·04 |
| Khami                       | ... | ... | ... | —    | —    |
| Lower Rangemore             | ... | ... | ... | —    | —    |
| Matopo Mission              | ... | ... | ... | —    | —    |
| Maxim Hill                  | ... | ... | ... | —    | —    |
| Melinakanda Junction        | ... | ... | ... | —    | —    |
| Nyamandhlovu (Railway)      | ... | ... | ... | —    | —    |
| Observatory                 | ... | ... | ... | —    | —    |
| Pendennis                   | ... | ... | ... | —    | —    |
| Raylton                     | ... | ... | ... | —    | —    |
| Rhodes Matopo Park          | ... | ... | ... | Nil  | —    |
| Umgusa                      | ... | ... | ... | —    | —    |
| Umkien                      | ... | ... | ... | —    | —    |
| Gwanda—                     |     |     |     |      |      |
| Antelope Mine               | ... | ... | ... | —    | —    |
| Gwanda (Gaol)               | ... | ... | ... | 0·09 | 0·01 |
| „ (Railway)                 | ... | ... | ... | 0·02 | —    |
| Malundi                     | ... | ... | ... | —    | —    |
| Mtshabzi Mission            | ... | ... | ... | 0·01 | 0·01 |
| West Nicholson (Railway)    | ... | ... | ... | 0·30 | —    |
| Gwelo—                      |     |     |     |      |      |
| Globe and Phoenix (Railway) | ... | ... | ... | —    | —    |
| Gwelo (Gaol)                | ... | ... | ... | —    | Nil  |
| Gwelo (Railway)             | ... | ... | ... | —    | —    |
| Lalapanzi                   | ... | ... | ... | 0·06 | 0·02 |
| Lochiel                     | ... | ... | ... | —    | —    |
| Lower Gwelo                 | ... | ... | ... | —    | —    |
| Que Que                     | ... | ... | ... | —    | —    |
| Rhodesdale Estate           | ... | ... | ... | —    | —    |
| Selukwe (Railway)           | ... | ... | ... | 0·37 | —    |
| Shangani                    | ... | ... | ... | —    | —    |
| Shawlands                   | ... | ... | ... | —    | —    |
| Sheltered Vale              | ... | ... | ... | —    | —    |
| Sikombela                   | ... | ... | ... | —    | —    |
| Mafungabusi—                |     |     |     |      |      |
| Inyoka                      | ... | ... | ... | —    | —    |
| Mangwe—                     |     |     |     |      |      |
| Empandeni                   | ... | ... | ... | —    | —    |
| Garth                       | ... | ... | ... | 0·02 | 0·01 |

RAINFALL (*Continued*)

| STATION                  |     |     |     | May  | June |
|--------------------------|-----|-----|-----|------|------|
| MATABELELAND—(Continued) |     |     |     |      |      |
| Tuli—                    |     |     |     |      |      |
| Lamulas                  | ... | ... | ... | 0·99 | Nil  |
| Langalanga               | ... | ... | ... | 0·92 | Nil  |
| Makalali                 | ... | ... | ... | 0·62 | Nil  |
| Manantji                 | ... | ... | ... | 0·61 | Nil  |
| Manyoni                  | ... | ... | ... | 0·30 | Nil  |
| Mazunga                  | ... | ... | ... | —    | —    |
| Tuli                     | ... | ... | ... | —    | —    |
| Wankies—                 |     |     |     |      |      |
| Malindi (Railway)        | ... | ... | ... | 0·41 | —    |
| Victoria Falls           | ... | ... | ... | —    | —    |
| Victoria Falls (Railway) | ... | ... | ... | 0·14 | —    |
| Wankies Hospital         | ... | ... | ... | —    | Nil  |
| Wankies (Railway)        | ... | ... | ... | —    | —    |

— No return.

# Dates of Meetings of Farmers' Associations, Southern Rhodesia

(SUBJECT TO ALTERATION)

DATES OF MEETINGS OF FARMERS' ASSOCIATIONS.

941

| Name of Association                   | Place of Meeting                    | Secretary            | 1914   |             |         |
|---------------------------------------|-------------------------------------|----------------------|--------|-------------|---------|
|                                       |                                     |                      | August | September   | October |
| Bindura                               | Bindura                             | A. M. Robb           | ..     | 10          | ..      |
| Charter—Mgezi                         | ..                                  | W. Krienke           | ..     | 30          | ..      |
| Central                               | ..                                  | N. Dainty            | 28     | 25          | 30      |
| Enterprise                            | ..                                  | J. F. Pilgrim        | 11     | 8           | 13      |
| Figtree Branch, R.L. and F.A.         | Figtree Station                     | A. Curtis            | 1      | ..          | ..      |
| Gatooma                               | Gatooma                             | ..                   | 15     | 19          | ..      |
| Gazaland                              | ..                                  | ..                   | ..     | ..          | 17      |
| Greystone                             | Chipinga                            | W. Wood              | ..     | 12          | 29      |
| Hartley                               | Roodeheuevel, Shangani              | J. W. Spencer        | ..     | 12          | 10      |
| Headlands                             | Hartley                             | H. Savory            | 8      | 5           | 10      |
| Hunter's Road Farmers and Stockowners | Hunter's Road Siding                | H. Barnes Pope       | 8      | 26          | ..      |
| Insiza                                | Insiza Station Hotel                | R. W. Twilley        | ..     | 12          | 10      |
| Iron Mine Hill Proper                 | Iron Mine Hill                      | N. C. St. J. Breslin | 1      | ..          | ..      |
| Lalapanzani and Iron Mine Hill        | Lalapanzani and Iron Mine Hill alt. | T. Irving            | 8      | 12          | ..      |
| Lomagundi                             | Simola                              | Cyril Allen          | 21     | 18          | 16      |
| Macheke                               | Macheke                             | W. Abbott            | 15     | 19          | 17      |
| Makwiro                               | Makwiro                             | H. H. Kidson         | ..     | 5           | ..      |
| Marandellas                           | Marandellas Farmers' Hall           | F. R. McLellan       | 21     | 18          | 16      |
| Mangwendi                             | Fixed every meeting                 | E. P. de Kock        | 1      | 5           | 3       |
| Makoni                                | Rusape                              | Luke Green           | ..     | 2           | ..      |
| Marula                                | Marula Siding                       | J. A. Tapson         | 1      | 5           | ..      |
| Mashonaland                           | Commercial Hotel, Salisbury         | Mac. W. Ingram       | 22     | 26          | 24      |
| Matopo Branch, R.L. and F.A.          | Malindi Hotel                       | W. H. Williamson     | 8      | 12          | 10      |
| Mazoe                                 | Glendale Siding                     | W. Bathurst          | 12     | ..          | ..      |
| Melsetter (North)                     | Various farms                       | R. Newett            | 12     | 9           | 14      |
| Midlands                              | Gwelo                               | Rev. R. Wodehouse    | ..     | 5           | ..      |
| Northern                              | Farm "Summerfield"                  | J. F. Ward           | 8      | 12          | 10      |
| Phuntree                              | Phuntree                            | R. V. H. Blurton     | ..     | ..          | 3       |
| Que Que                               | Globe and Phoenix Hotel             | J. G. Riach          | ..     | 3           | ..      |
| Rhodesian Landowners and Farmers      | Library Buildings, Bulawayo         | E. E. Somersel       | 15     | 19          | 17      |
| Shamva                                | Shamva                              | I. S. Hopkins        | 28     | 25          | 30      |
| Southern Insiza                       | Peggy Hotel, Insiza                 | J. M. Moubay         | 2      | dates fixed | 4       |
| Selukwe                               | Selukwe                             | W. J. B. Harris      | ..     | 6           | ..      |
| Somabula and Shangani Flats           | Fairview                            | F. S. Clark          | ..     | dates fixed | ..      |
| Umvukwe                               | Umvukwe                             | G. B. Botha          | ..     | ..          | ..      |
| Umtali                                | Christmas Pass Hotel                | Hon. J. S. Parker    | ..     | dates fixed | 3       |
| Victoria                              | Victoria                            | J. S. Holland        | 1      | 5           | 21      |
| Vungu                                 | Vungu                               | H. S. Hoatson        | 19     | 16          | ..      |
| West Gwelo                            | Somabula                            | J. H. Erasmus        | ..     | ..          | 10      |
|                                       |                                     | A. P. Shone          | 8      | 12          | 1       |



## Departmental Notices.

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### Information for Farmers

The Department of Agriculture is prepared to furnish to farmers technical advice either by correspondence, or, where possible, by personal visits. All communications should be addressed in the first instance to the Director of Agriculture.

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### Crops

The Agricultural Branch deals with enquiries relating to agricultural practice, soils, crops, cultural operations, processes, seeds, trees, farm implements and machinery, etc.

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### Disposal of Pure Seed.

Farmers devoting special attention to the production of pure seed of any locally grown crops are invited to communicate with the Government Agriculturist, and at the same time to submit a  $\frac{1}{4}$  lb. sample of any seed which they may have for disposal.

In addition to indicating the total amount of seed offered and the price f.o.r. the nearest railway station or siding, the correct name of the variety and the origin of the seed from which the crop was grown should be given. In the case of special attention having been devoted to seed selection, the methods employed should be described.

Where these stipulations are complied with, and the samples forwarded are deemed by the Agriculturist of sufficiently high quality for seed purposes, growers and intending purchasers will be put in touch with one another. It is hoped by this means to encourage the production of pure seed, and growers are urged whenever possible to sell their seed under guarantee of trueness to name, type and sample deposited with the Department.

After placing growers and would-be purchasers in touch with one another, the Department can accept no further responsibility except in the position of adjudicator when bulk

supplies are thought inferior to sample and description, in which case both parties will be required to abide by the decision of the Department.

For further particulars see article on Pure Seed Supply, *Rhodesia Agricultural Journal*, February, 1914.

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### Farm Seeds

The undermentioned seeds grown on the Government Experiment Farms are now available for sale at the prices stated. Those in Section A have been grown in Mashonaland, and the prices are f.o.r. Salisbury. Those in Section B are the produce of the Matabeleland Experiment Farm, and will be delivered f.o.r. Bembesi.

*All orders for seed must be addressed in the first instance to the Government Agriculturist, Department of Agriculture, Salisbury.*

*Section A.*—(1) *Specially selected seed maize, Salisbury White, Hickory King 10 row and Hickory King 8 row, 15s. per 100 lbs.*

(2) *Selected seed maize of the above varieties, 12s. 6d per 100 lbs.*

(3) *Seed grain on the ear, of the above varieties, in lots not exceeding 50 ears to any one applicant, price 10s. per lot.*

*The above shelled seed has all been carefully selected, tipped, butted and hand-shelled. Supplies are limited, and in order to meet the large demand, not more than one to two bags can be supplied to each applicant.*

(4) *Japanese and silver-hulled buckwheat, 10s. per 100 lbs.*

(5) *German millet and Dhal, 3d. per lb.*

(6) *Striped Russian and black sunflower seed, 2d. per lb.*

(7) *Victoria and Le Roux wheat (summer), 15s. per 100 lbs.*

(8) *White flowering and large seeded linseed, 4d. per lb.*

(9) *Spanish ground-nuts and New Era cow-peas, 20s. per 100 lbs.*

- Section B.*—(1) Japanese buckwheat, 10s. per 100 lbs.  
(2) German and Japanese millet and Dhal, 3d. per lb.  
(3) Teff grass seed, 6d. per lb.  
(4) Sapling kafir corn, 15s. per 100 lbs.  
(5) New Era and Natal black cow-pea, 20s. per 100 lbs.

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### Poisonous Plants

It is of great importance that as soon as possible a study should be made of those plants found in Southern Rhodesia which are poisonous or deleterious to small or large stock. Farmers and others who have known, or suspected poisonous plants on their property, are requested to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, at the same time forwarding specimens of the plant, including stem, leaves, flowers, and, where possible, fruit. Any particular regarding the habits of the plant will be welcomed, and in return the Department will supply all available information regarding the plants.

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### Tobacco

The services of the Tobacco Expert are available to all desiring advice on the subject. Applications should be accompanied by particulars of the nature of the information sought, also the distance and direction of the farm from some well known centre.

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### Live Stock

The Animal Industry Branch is prepared to advise with regard to all matters connected with stock breeding, selection feeding and registration of stud animals, the dairy industry, poultry management, farm buildings for stock, and kindred subjects. Buyers and sellers of stud stock in Rhodesia are also put in touch with one another.

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### Entomology

The Government Entomologist advises on matters connected with insect pests of live stock, crops, and fruit trees, and also undertakes the inspection of nurseries and of the importation of plants from abroad.



## Chemical Analyses

The Government Agricultural Chemist deals with matters relating to the composition of soils, fertilisers, farm produce of vegetable or animal origin; also the investigation of poisons and of articles of potential economic value.

Nominal charges are made, which, while not covering the cost, will help to defray the expense and serve as a proof of good faith. Samples, carriage prepaid, together with full particulars regarding the subject should be addressed to the Agricultural Chemist, Department of Agriculture, Salisbury.

A schedule of charges and directions for taking samples will be furnished on application.

With all analyses, reports will be furnished explanatory of the results and, when possible, advice given as to the nature, properties and value of the material.

No charge will be made for analysis where the material forwarded is considered by the Director of Agriculture and Chemist to be of sufficient general interest.

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## Services of Government Veterinary Surgeons

1. The services of Government Veterinary Surgeons are available to the public, free of charge, for the following purposes only :—

- (1) Attending and giving professional advice in connection with the following diseases, viz. :—Anthrax, Contagious abortion, East Coast Fever, Epizootic Lymphangitis, Foot and Mouth Disease, Farcy, Foot-rot, Heartwater, Glanders, Intestinal parasites amongst sheep and goats, Liver Disease, Lungsickness, Osteo Porosis, Malarial Catarrhal Fever (blue tongue), Rabies, Redwater, Rinderpest, Scabies, Sponziekte (quarter evil), Swine Fever, and any other diseases which may in future be scheduled in terms of section 3, sub-section 18 of the "Animals Diseases Consolidation Ordinance, 1906." Attending to cases of disease amongst live stock which, though not of a contagious or infectious character, may be of general public importance.

- (2) Applying tests in regard to Glanders, Tuberculosis, or any other disease against the introduction or spread of which tests are applied under regulations.
- (3) Inoculations against the following diseases :—  
Horsesickness, Lungsickness, Anthrax, Quarter Evil, Redwater, Malarial Catarrhal Fever (blue tongue). A fee to cover the cost of serum and virus will be charged.

2. The following charges shall be made and payable for services rendered by the Government Veterinary Surgeons in other cases, viz. :—

|   | £ | s. | d. |
|---|---|----|----|
| (1) For every professional visit within three miles of his office or residence ... ..   | 0 | 5  | 0  |
| (2) For every professional visit beyond such distance ... ..<br>plus an additional charge of 2/6 per hour whilst engaged in such visits or £2/2/0 a day of 24 hours ; | 0 | 10 | 6  |
| (3) For advice given at the Veterinary Surgeon's office, for each animal, per visit   | 0 | 2  | 6  |
| (4) The following to be charged in addition to visiting fees :—   |   |    |    |
| a. For every examination as to soundness, each ... ..   | 1 | 1  | 0  |
| b. For castration, horses, each ... ..  | 1 | 1  | 0  |
| c. For castration, bulls, each ....   | 0 | 5  | 0  |
| d. For castration, donkeys, each.. ...  | 0 | 10 | 6  |
| e. For parturition cases, mares, each   | 2 | 2  | 0  |
| f. For parturition cases, cows, each..  | 1 | 1  | 0  |
| g. For other operations, according to nature, from 5/- to £2/2/0.   |   |    |    |

3. Double the above fees will be payable for services rendered on Sundays, public holidays, and between the hours of 7 p.m. and 7 a.m.

4. Applicants for the services of Government Veterinary Surgeons must at their own cost provide the necessary transport for the conveyance of these officers from, and back to, their residence or nearest railway station.

5. Farmers and owners of stock throughout the country frequently telegraph for a Government Veterinary Surgeon to



be sent to attend an animal which has been taken seriously ill. It is rarely possible to comply with these requests at once, as the Veterinary Surgeon may be engaged on duty which he cannot leave, or is at such a distance from where his services are required that he can hardly be expected to arrive in time to be of any service in an urgent case. Hence much valuable time is wasted, the owner of the animal is dissatisfied, and the veterinary staff discredited. To obviate this, in all cases where veterinary advice and assistance are required, the owner should telegraph to "Veteran," Salisbury, with prepaid reply, the nature of the complaint that the animal is suffering from, giving as full and accurate a description of the symptoms as possible. This will enable the Chief Veterinary Surgeon to telegraph advice at once and state whether he is able to arrange for veterinary attendance on the case or not, and save valuable time, which is always of importance in acute cases.

6. The services of Government Veterinary Surgeons will only be available for private work with the consent of such officers, and when such work does not interfere with their official duties, or when the services of a private practitioner are not available.

7. As the arrangement of allowing Government Veterinary Surgeons to attend to private cases is intended purely for the benefit of farmers and stock-owners who may wish to obtain professional advice, no responsibility whatever will be accepted for any loss of stock, etc., which may result from the negligent treatment or advice, or wilful default, of any Government Veterinary Surgeon.

8. All fees collected in terms of these Regulations are payable to the Treasury through the local Receiver of Revenue.

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### Irrigation

From the Agricultural Engineer assistance may be obtained by farmers for the following :—

1. In the locating of possible irrigation projects.
2. In the preparation of surveys or plans and for irrigation works, including weirs, dams, furrows, pumping plants, and determining the extent of land which



may be brought under irrigation schemes, together with rough estimates of costs.

3. In the supervision of construction and carrying out of projects.
4. In the selection of suitable sites for boring operations.
5. Preparing specifications, etc., regarding pumping plants, windmills, and agricultural machinery.
6. Giving general advice on cognate subjects.

Informal advice of a general character will be given to applicants making enquiry by letter or in person. Any applicant desiring professional assistance likely to occupy more than one day should apply for advice in writing. All applicants should specify clearly the nature of the project on which they seek advice, and should give full particulars as to the distance and direction of their farms from some well-known centre. Applicants will be required to provide suitable means of transport for the officer concerned during the period devoted to work on the spot; to provide any unskilled labour that may be required; and to provide for any other contingent services. Applications should be addressed to the Director of Agriculture, who will endeavour to arrange visits as far as possible in order of application, but with due regard to situation, in order to obviate unnecessary travelling and delay. The services of the Agricultural Engineer are given free, but in cases demanding prolonged individual attention, or repeated supervision, a charge may be made according to circumstances.

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## Samples

In connection with enquiries, especially with regard to diseases amongst crops, insect pests, soils, grain and the identification of plants, specimens should, wherever possible, be sent, together with full details. It is found that such parcels are often forwarded without any indication of where they are from or why they were sent and it is difficult in such cases to trace the sender. It is, therefore, requested that persons when forwarding samples for examination, indicate clearly their names and address on the package, so as to enable their requirements to be attended to without delay.

## Charges for Dipping Cattle at Government Dipping Tanks.

A charge of 1d. per head is made in respect of all cattle dipped at Government dipping tanks.

Unweaned calves will be dipped free of charge.

Payment may be made in cash or by means of books of coupons at £1, 10/- and 2/6, which can be obtained from Civil Commissioners, Native Commissioners, or through all Veterinary Surgeons and Cattle Inspectors.

The tanks to which these provisions at present apply are the following :—

Salisbury (3), Bulawayo (3), Inyati, Umtali, Penhalonga, Melsetter, Marandellas, Macheke, Mazoe, Lomagundi, Hartley, Gwelo, Selukwe, Enkeldoorn, Victoria, Gwanda, Gatooma, Que Que, Umvuma, Kimberley Reefs.

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## Lectures for Farmers

The services of certain of the officers of the Department of Agriculture and the Veterinary Department are available for purposes of delivering lectures on subjects upon which they have special knowledge. As far as practicable, lectures will be accompanied by demonstrations at the time or subsequently in the field. Owing to the many calls on the time of the staff and the exigencies of their duties, alternative dates are desirable in order to avoid disappointment. The following topics are offered as examples of subjects that may be dealt with in this manner, but the suggestion of other themes is invited.

*Agriculture.*—Maize growing; Maize selection and maintenance of the breeding plot; Points of maize and maize judging, with demonstrations; Utilisation of granite vlei soils; Ground nut culture; Rotation crops for home use and for sale; Veld improvement by winter grasses; Production of foodstuffs for the mines; Ensilage; Fungoid diseases of maize and wheat; Wheat, oats and lucerne under irrigation; The prospects of cotton culture in Southern Rhodesia.

*Veterinary Hygiene.*—Detection and prevention of disease; The care of live stock.

*Live Stock.*—Judging of cattle according to breeds, and for beef, milk and draught; feeding and kraaling of live stock; general principles of cattle breeding; management of imported stock; grading up of native or local stock with pure bred bulls.

*Dairying.*—Home butter-making; building and equipment of a farm dairy; handling and marketing of milk; packing and marketing of butter; construction of cow houses.

*Swine Husbandry.*—Breeding and feeding of swine; some suggestions for the production of first-class bacon pigs; construction of piggeries at moderate cost.

*Chemistry.*—The principles of soil fertility; the principles of manuring; the value of lime in agriculture; chemistry of milk and its products (accompanied by demonstrations in milk-testing).

*Entomology.*—Economic entomology on the farm; the role of insects and their allies in the transmission of disease; scale insects and fruit trees and methods for their control; insect pests and maize; enemies of the potato, insect and fungus; the value and objects of plant import and nursery regulations.

*Irrigation.*—Methods of applying water to land for irrigation; the measurement of water in connection with irrigation; canal irrigation; storage reservoirs; hints on the selection of sites and on the design of earthen and other dams; irrigation by pumping, with notes on the selection of plants.

Enquiries and invitations should in the first instance be addressed to the Director of Agriculture, Salisbury.



## Departmental Bulletins

The following Bulletins, consisting of reprints of articles which have appeared in this Journal, are available for distribution free of charge to applicants in Rhodesia :—

### AGRICULTURE.

- No. 2. The Possibilities of Rhodesia as a Citrus Growing Country, by R. McIlwaine, M.A., LL.B.
- No. 61. Requirements in sending Botanical Specimens to the Department for Identification.
- No. 62. Services of Agricultural Engineer.
- No. 64. Hints on Irrigation—Small Gravitation Schemes, by W. M. Watt.
- No. 81. Possibilities of Export Trade in Oil Seeds, by H. Godfrey Mundy, F.L.S.
- No. 90. Reports on Experiments—Experimental Station, Salisbury, 1910-1911, by J. H. Hampton.
- No. 94. Second Report on Experiments, by J. H. Hampton.
- No. 125. Subterranean Water, by W. M. Watt.
- No. 137. Drainage for Irrigated and Swampy Land, by W. M. Watt.
- No. 153. Citrus Fruit Trees—From Seed to Grove.
- No. 155. The Manuring of Maize on the Government Experimental Farm, Gwebi, 1912-13.
- No. 156. Elephant Grass or Napier's Fodder, by J. A. T. Walters, B.A.
- No. 160. Hints on Irrigation—Pumping Plants, by W. M. Watt, Agricultural Engineer.
- No. 164. Citrus Fruits in Rhodesia—Suggestions as to where to Plant, by C. E. Farmer.
- No. 166. Rhodesian Citrus Fruits—Exportation to London.
- No. 173. Citrus Fruits : Cultivation and Pruning, by C. E. Farmer.
- No. 177. Notes on the Raising of Seedling Trees, by F. B. Willoughby.
- No. 182. Some Citrus Growing Experiences in Rhodesia, by R. McIlwaine, M.A., LL.B.
- No. —. Orange and Lemon Growing in Southern Rhodesia, by R. McIlwaine.
- Tree Culture in Southern Rhodesia, by P. B. S. Wrey, A.M.I.C.E.

### CROPS.

- No. 88. Chicory Growing, by H. Godfrey Mundy, F.L.S.
- No. 106. Cultivation and Preparation of Ginger.
- No. 107. The Cowpea, by R. H. B. Dickson.
- No. 126. Turkish Tobacco.
- No. 128. Paspalum, by J. A. T. Walters, B.A., Assistant Agriculturist and Botanist.
- No. 132. Sumatra Tobacco, Hints to Rhodesian Growers, by C. J. Sketchley.
- No. 133. Tobacco Culture (Virginia)—Planting, Cultivation, Fertilising, Priming, Topping, Suckering, Ripening.
- No. 138. Tobacco Culture (Virginia)—Harvesting and Curing.
- No. 162. Rhodesian Maize : The Principal Types and their Points, by J. A. T. Walters, B.A., Assistant Agriculturist.

- No. 170. Production of Pedigree Seed—Maize, by H. Godfrey Mundy, F.L.S.  
 No. 174. Notes on Hop Growing, by H. Godfrey Mundy, F.L.S.  
 No. 175. Notes on Lucerne, by H. Godfrey Mundy, F.L.S.  
 No. 176. The Cultivation of Castor Oil Beans, by H. Godfrey Mundy, F.L.S.  
 No. 179. Buckwheat, by H. G. Mundy, F.L.S.  
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## Employment on Farms.

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The Department of Agriculture receives numerous enquiries from persons of varied attainments, age and financial position for openings on farms, as managers, assistants and learners, requiring remuneration on corresponding scales, or willing to give services in return for keep.

In order that work may be found for the above and needs of farmers met, applications are invited from both employers and persons seeking employment. Applications are also invited from artisans, such as masons, bricklayers, carpenters, fencers, well sinkers, concrete workers, and the like who may desire work on farms. In cases where employers have obtained the labour they require, or applicants for employment have found work, it is requested that notification be at once sent to the Department of Agriculture, in order that unnecessary correspondence be avoided.

Replies to the following applications should be addressed to the initials of the advertisers, c/o Director of Agriculture, who will forward the letter to the party referred to.

---

### SITUATIONS VACANT.

J. M. G.—Wanted man with small capital to farm on shares maize lands, extensive and good.

X. Y. Z.—Wanted farm manager for Northern Rhodesia, cattle and mixed agriculture. Must have first-class references. Apply stating salary required.

R. A. M.—Farm pupils. Instruction given in general farming. Lodging found, but board to be paid for.

H. B. P.—Farm pupil. Premium £120 per annum. General instruction given. Board and lodging provided.

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### SITUATIONS WANTED.

P. T.—As farm manager. Twenty years' Natal and Rhodesian experience; cattle, mixed agriculture and tobacco.

H. C. T.—General farming, as manager or assistant, brought up on farm. Two years' training Elsenberg Agricultural College. Knowledge of native language. First-class references.

H. B.—Energetic man, married; general farm work, agriculture, dairying and poultry; capable steam tractor driver and fitter; also pump work and well-sinking.

Roderick S. Marshall, Barrow-on-Humber, Hull, England.—Scotch, 20 years of age. Has had experience in dairying (Ayrshires), also in beef-raising, sheep, pigs, horses and general agriculture. Would work for board and lodging the first year.

A. B. B.—As farm manager. Experience in general farming in Natal and Rhodesia. Salary or salary and shares.

G. H. B.—Assistant on general farm. Board and lodging and small salary.

I. C. C.—Assistant on general farm. Seven years' farming experience in Ireland.

W. C. C.—Understands tobacco growing and general farming.

H. E. E.—Assistant on general farm; twelve months' experience in New Mexico.

D. M. K.—Assistant on ranch or mixed farm. £10 per month with board and lodging.

A. E. M. K.—Farm assistant; general or ranch. Experience in farming in Scotland and Cape Province. £5 per month and board.

E. N. P. wishes to gain experience on general farm.

M. J. P.—Good general experience in dairying and general farming. Salary and share of profits.

C. R. I.—Assistant on mixed farm; experienced in tobacco growing and curing.

G. S. M.—Manager of tobacco farm; four years' experience of growing and curing. Share or salary and share.

E. L. S.—Farm pupil on tobacco farm.

H. B.—Manager on ranch. Terms to be arranged.

C. A. B.—Practical experience of farming in Tati Concession.

J. C. B.—Experience in general farming and cattle in Rhodesia.

C. M. C.—Experience in general farming including tobacco, understands brick making and building, also surveying. Has had experience in managing estates.

B. H. W. F.—Experience as farm assistant.

J. H. G.—Farm manager or assistant. Farmed in Rhodesia eight years, also Home experience. Understands mixed farming.

J. H. W. H.—Prepared to work on shares.

H. W. L.—Assistant on ranch or irrigation farm. Can drive steam, oil and gas engines.

A. M.—Expert cattle man. Thoroughly understands purchase and care of pedigree stock. Lately in charge of pure-bred herds in Transvaal.

C. L. P.—Manager of stock or general farm. Twenty years' experience in general farming.

R. S.—Age 18. Two years' training in agriculture at Harris Institute, Preston. Nine months' practical experience in Transvaal.

C. V. R.—Experienced farm assistant, understands brick making and dipping tank construction.

X. Y. Z.—Young man, age 28, seeks occupation on farm, preferably with family, fair knowledge of language, considerable engineering experience. Small salary. Might run part stock if suitable opening found.

## Government Notices.

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No. 50 of 1912.]

[8th February, 1912.]

### AFRICAN COAST FEVER.

*Regulations regarding the movement of cattle and the prevention and suppression of disease.*

1. UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw Government Notices Nos. 329 of 1910 and 308 of 1911 and make the following provisions in lieu thereof :—

2. The various districts of Southern Rhodesia are hereby declared an area infected with African Coast Fever for the purposes of section 5 (2) of the aforesaid Ordinance, and, save as hereinafter set out, all movement of cattle within the said districts is prohibited until further notice.

#### *General Movement.*

3. For the purpose of section 22 (1) of the said Ordinance, the following shall be regarded as places within the boundaries of which the movement of cattle may be allowed without special permission :—

- (a) Single farm.
- (b) Two or more adjoining farms, farmed together under one management and situated within one cattle transport area.
- (c) An area, the property of one owner, enclosed by a substantial fence.
- (d) For grazing purposes, an area within a radius of four miles of native kraals situated on unalienated land or in reserves, save and in so far as such area includes any private land.

The sites of such kraals shall be deemed to be the places where they are situated at the date of promulgation of these regulations.

4. Notwithstanding the provisions of the last preceding section, or of section 9 hereof, the Chief Inspector may, on the outbreak of disease, or for such other cause as may be deemed expedient, direct the isolation or quarantine of cattle on a limited area of the aforesaid places.

5. The movement of cattle from place to place may be permitted under the special permission, in writing, of an Inspector, Sub-Inspector, or other officer or person duly authorised by the Administrator to grant such permission.

6. No permission as aforesaid shall permit the movement of cattle—

- (a) Without the written consent of the owners, occupiers or managers of occupied land, and in the case of native reserves, of the Native Commissioner of the district over which land or reserve such cattle will pass, whether along roads or otherwise; provided, however, that refusal to grant such consent shall be in writing, and provided further that if the Controller of Stock or the Chief Inspector shall consider that such consent is withheld without good and sufficient cause he may permit of movement without such consent.



If any such person mentioned above refuse to give consent or to state a reason for refusing to do so in writing, no valid objection shall be deemed to exist and movement may be permitted without such written consent.

- (b) Within a veterinary district as defined in the Schedule annexed hereto from one transport area to or through another without the consent of the Cattle Inspector in charge of such area.
- (c) From any veterinary district to or through another without the consent of the District Veterinary Surgeon of such district.

#### *Slaughter Cattle.*

7. Cattle moved to any centre for slaughter under the provisions of these or any other regulations shall, on arrival, be immediately taken to such quarantine area (if any) as is provided for the purpose and immediately branded with the letters "V.D." on the near hip.

8. Cattle admitted to a quarantine area in terms of the last preceding section shall be slaughtered within twenty-one days of the date of admission, and shall not be permitted to leave the same except for the purpose of being slaughtered at the appointed abattoir, and if found outside such area, except for the said purpose, may be destroyed on the order of the Chief Inspector or Controller of Stock; provided, however, that the Chief Inspector may allow the removal of cattle from such an area under such conditions as he may prescribe.

#### *Transport Cattle.*

9. The use of cattle for draught purposes is prohibited except :—

- (1) Within the boundaries of the places defined in section 3 (a), (b) and (c) hereof.
- (2) Within the boundaries of areas already fixed for the use of cattle for draught purposes in terms of regulations published under Government Notice No. 329 of 1910, or such other areas as may be fixed by the Administrator.

10. Notwithstanding the provisions of section 9, no permit shall authorise the working of cattle

- (a) which are not clearly and distinctly branded with the registered brand of the owner;
- (b) in any wagon or vehicle which shall not have the owner's name and address legibly and permanently inscribed on the right side thereof.

11. No wagon or other vehicle drawn by oxen shall be moved from one cattle transport area into another without the permission of the Cattle Inspectors concerned, and under such conditions as they may impose.

#### *General Provisions.*

12. On the outbreak or suspected outbreak of disease, the Administrator may declare an area of infection around and embracing the place of outbreak or suspected outbreak, and a further area or areas around such area of infection as a guard area, whereupon all movement of cattle into and from place to place within such area or areas shall be immediately suspended, except as hereinafter provided.

A.—*In areas of infection and guard areas:—*

- (1) Cattle in transit by rail may be moved through such area.
- (2) Cattle from beyond the borders of Southern Rhodesia may be detained within such area or areas *en route* to destination.
- (3) Cattle for *bona fide* farming; dairy and slaughter purposes may be moved into such area or areas by permission of the Chief Inspector and under such conditions as he may impose.

*B.—In guard areas only:—*

Cattle may be moved into and from place to place within such area under the conditions of section 6 hereof.

13. The removal of green forage, hay, fodder, bedding reeds, manure or of such other articles as may be reasonably supposed capable of conveying infection, shall be prohibited from areas of infection, save and except with the special permission of the Administrator.

14. Whenever an area shall have been declared under section 12 hereof, every person within such area, or within such further area as may be specified by Government Notice, owning or in charge of cattle shall, upon the death or slaughter because of disease, suspected disease, or accident, of any such cattle, immediately report such occurrence through the nearest Cattle Inspector, Native Commissioner or Police Officer to the District Veterinary Surgeon.

15. Notwithstanding the provisions of these regulations, it shall be competent for the Chief Inspector of Cattle to authorise and direct the movement of cattle for the purposes of isolating, dipping, quarantine, or any other such objects as may be deemed necessary to prevent or suppress an outbreak of disease.

16. Whenever an area shall have been declared an area of infection or guard area in terms of section 12 hereof, any person who shall allow any cattle to stray or be otherwise removed, except as provided for in these regulations, from any one place within such area to another place, or from a place outside of to a place within such area, shall be guilty of an offence against these regulations.

17. All cattle within the limits of the various commonages and townlands, areas of infection and guard areas as declared under section 12 hereof, or depastured on common grazing ground, shall be dipped or sprayed at least once in every three days, unless the Chief Inspector shall authorise the extension of the time between such dipping or spraying, or the entire suspension of the same.

18. In all areas of infection and guard areas sheep and goats shall be dipped at such periods as may be directed by the Chief Inspector.

19. Whenever the owner, occupier, or manager of a farm shall adopt means of cleansing cattle running thereon, either by spraying, dipping, or by any other method, the Chief Inspector may order any natives or other persons having cattle on the same farm to cleanse such cattle, and the Native Commissioner of the district within which the farm is situated may enter into an arrangement with the native owners of cattle to cleanse such cattle at a charge to be mutually agreed upon between the said owner, occupier or manager and the said native owners.

20. All permits for the removal of cattle issued under the provisions of the said Ordinance or of any regulations framed thereunder shall specify legibly and clearly on the face thereof the place from and to which such cattle may be removed, the route by which they shall travel, the number and brands of such cattle, the time allowed for the journey, and such other particulars and conditions as it may be deemed expedient to provide.

21. No permit issued for the movement of cattle shall be taken to authorise any trespass in connection with such movement.

22. Notwithstanding the provisions of these regulations, it shall not be lawful for any owner of cattle to allow any such cattle to be on any road, public outspan, commonage, or any property other than that of the owner, unless they are free from ticks or unless they have been effectively cleansed by dipping, spraying or other process, within fourteen days of being allowed on such road or other place. Any beast having ten or more ticks on it shall not be considered free from ticks.

23. Any person contravening the provisions of these regulations or the conditions set out in permits issued thereunder, shall, where no higher penalty has been by the said Ordinance or any other law provided, be liable in respect of each offence to a fine not exceeding £20, or in default of payment to imprisonment with or without hard labour for a period not exceeding three months.



## SCHEDULE "A."

## VETERINARY DISTRICTS OF SOUTHERN RHODESIA.

(1) *Salisbury.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912 :—

32. Battlefields; 33. Hartley and Gatooma; 34. Gadzema Station; 35. Makwiro Station; 36. Norton Siding; 37. Hunyani Tank; 38. 1645½ Peg B. & M. & R. Railways; 39. Salisbury A.; 40. Salisbury B.; 41. Salisbury C.; 42. Salisbury D.; 43. Arcturus; 44. Bromley; 45. Marandellas North; 46. Marandellas South; 48. Headlands Station; 49. Junction Mazoe and Lomagundi Railways; 50. 23-Mile Peg, Lomagundi Railway; 51. Passaford Station; 52. 35-Mile Peg, Lomagundi Railway; 53. Gwibi Tank Halt; 54. Banket, Lomagundi; 55. Eldorado, Lomagundi; 56. Selby Siding; 57. Mazoe; and 58. Kimberley Reefs.

(2) *Bulawayo.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912 :—

1. Plumtree; 2. Marula Siding; 3. Figtree; 4. Westacre Junction; 5. Bulawayo Area; 6. Heaney Junction; 7. Bembesi Station; 8. Insiza North; 9. Insiza South; 10. Shangani North; 11. Shangani South; 14. Redbank; 15. Nyamandhlovu Station; 16. Malindi Station; 17. Wankies Area; 18. Matetsi Siding; 19. Matopo Terminus; 20. Sabiwa Siding; 21. Gwanda Station; 22. West Nicholson; 23. Belingwe; 59. Essexvale and Balla Balla Areas; 60. Stanmore Siding Area; 61. Filabusi Area.

(3) *Gwelo.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912 :—

12. Somabula Siding; 13. Gwelo Station; 24. Selukwe Area; 25. Surprise Area; 26. Indiva Siding; 27. Lalapanzi; 28. Iron Mine Hill Siding; 29. Umvuma Siding; 31. Que Que Station.

(4) *Umtali.*

An area comprising the native districts of Umtali, Melsetter, Makoni and Inyanga.

No. 24 of 1914.]

[14th January, 1914.

## AFRICAN COAST FEVER.

(As amended by No. 207 of 1914.)

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Government Notices Nos. 82, 129, 143, 258, 297 and 326 of 1913, and, in terms of section 12 of Government Notice No. 50 of 1912, declare the following areas of infection and guard areas :—

## (1) NATIVE DISTRICT OF MATOBO.

(a) *Area of Infection.*

The farms Collaton and Irene and the Mabogutwani Outspan.

## (2) NATIVE DISTRICT OF SALISBURY.

(a) *Areas of Infection.*

- (1) Hatfield Estate and Hatfield Plots.
- (2) Salisbury Commonage.
- (3) M.T.C., Gallagher's Lease and Makabusi farms.
- (4) Epworth, Adelaide and Glenwood farms.



(b) *Guard Areas.*

- (1) The farms Haydon and Good Hope.
- (2) The farms Warren, Lochinvar, the eastern sub-division of Willowvale, Makabusi Outspan, Ardbennie Township, Waterfall, Hopley, Saturday Retreat, Odar Outspan, Stoneridge, Spreckley, Eyrecourt, Eyerston, Retreat, Prospect, Bunker's Hill, Adair, Boutelle, Godavery, Twentydales, Deanesbrook, Nalire Native Reserve, Galway Estate, Mayfair, Sebastopol, Dispute, Caledonia, Donnybrook, Greengrove, Ventersburg, Lorelei, Letombo Reserve and Greendale.

## (3) NATIVE DISTRICT OF UMTALI.

(a) *Areas of Infection.*

- (1) The farms Inodzi, Nyagari, Mountain Home (The B.), Umtali Mission and the Penhalonga Valley.
- (2) The farm Mabonda.

(b) *Guard Area.*

That portion of the native district of Umtali bounded on the south by a line running from the Odzi River along the south-western boundaries of the farms Odzi Junction, Grange, and Premier Estate, the western and southern boundaries of Wiermouth and the southern boundaries of Devonshire and Umtali Commonage.

No. 239 of 1914.]

[4th June, 1914.]

## AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby, in terms of section 12 of Government Notice No. 50 of 1912, declare the following area of infection and guard area in the native district of Salisbury.

(a) *Area of Infection.*

The farm Bluff Hill.

(b) *Guard Area.*

The farms Crowborough, Parkridge, Fontainebleau, Reserve, Tynwald, Mabel Reign, Avondale, Gillingham, Rainham, Stamford, Homefield, Dove-dale, Stapleford, Glen Lussa, St. Marnocks, Kinvarra, Selby, Mount Hampden, Mount Hampden Reserve, Bendaugh, Glenara, Eskbank, Oldbury, Komani, Hinricksen, Thorn Park, Zizalisari Outspan, Mount Pleasant, Teviotdale, Vainona, Pomona.

## AFRICAN COAST FEVER.

Government Notice No. 76 of 26th February, 1914, published in *Government Gazette* dated 27th February, 1914, amends the following areas in which the use of cattle for draught purposes may be permitted under the conditions of the regulations governing the movement of cattle:—

Plumtree, Marula Siding, Figtree, Westacre Junction, Bulawayo area, Heany Junction, Bembesi Station, Insiza North, Insiza South, Shangani North, Shangani South, Belingwe area, Redbank, Nyamandhlovu Station, Gwaai Station, Malindi, Wankie, Matetsi, Matopo Terminus, Essexvale, Balla Balla and Filabusi, Stanmore Siding, Gwanda, West Nicholson, Gwelo, Selukwe, Umvuma, Iron Mine Hill, Lalapanzi, Hunter's Road, Que Que, Hartley, Gatooma and Battlefields, Gadzema Station, Makwiro, Norton Siding, Gwebi Tank Halt, Lomagundi, Mazoe, Bindura.

No. 369 of 1913.]

[11th December, 1913.

## IMPORTATION AND USE OF VIRUS, VACCINE, ETC.

UNDER and by virtue of the powers vested in me by section 5, sub-section (6) (e), of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby provide as follows:—

(1) No person, firm or corporation shall manufacture, import, sell, barter or exchange any virus, vaccine, serum or analogous product used for the diagnosis or treatment of diseases of animals without the permission in writing of the Chief Inspector.

(2) No person shall use any virus, vaccine, serum, blood, bile or analogous product for the diagnosis or treatment of animals without the permission in writing of the Chief Inspector.

(3) Any person desiring to import, manufacture, sell, barter or exchange or to use any of the above-mentioned substances or products shall apply to the Chief Inspector for his requisite permission, which may be refused or granted under such conditions as the Chief Inspector may impose.

(4) Any person contravening any of the above regulations or failing to observe the conditions attached to any permit issued in terms of the last preceding sub-section shall be liable on conviction to a fine not exceeding £20, or in default of payment of any fine inflicted to imprisonment with or without hard labour for a period not exceeding three months.

No. 186 of 1914.]

[23rd April, 1914.

## IMPORTATION OF CATTLE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel the regulations published under Government Notice No. 128 of 1914, and make the following provisions in lieu thereof:—

1. The importation of cattle will be permitted from the Cape Province, the Orange Free State and the Transvaal on the following terms and conditions:—

(1) A permit shall be required from the Chief Inspector, which may contain such conditions as shall from time to time appear expedient.

(2) The importation of cattle with more than two permanent central incisor teeth shall not be permitted, except that animals entered in the South African Stud Book or the appendix thereto, with not more than the first and second pairs of permanent incisors, may be imported.

(3) Applications for permission to import shall be in the form "A" attached hereto, and accompanied by a declaration in the annexed form "B."

(4) All importations shall be by rail, and for the purposes of importation, Bulawayo shall be the port of entry.

(5) All cattle imported in terms of these regulations shall, on arrival at Bulawayo, Salisbury or Umtali, be submitted to such examination or tests as the Chief Inspector may direct. If such examination or tests disclose the existence of any destructive disease, the cattle shall be immediately destroyed and the carcasses thereof disposed of in such a manner as a Government Veterinary Surgeon may authorise or require. The Chief Inspector may permit of the age restriction and the tests aforesaid being dispensed with in the case of cattle in transit by rail to any place beyond the borders of Southern Rhodesia.



- (6) All expenses or losses incident to quarantine, examination, testing or destruction as aforesaid shall be borne by the owner of the cattle.

2. The importation of cattle from the United Kingdom of Great Britain and Ireland, the United States of America, the Kingdom of the Netherlands and Germany will be permitted under the following terms and conditions :—

- (1) Importation shall be through and direct from the ports of Cape Town or Port Elizabeth, and there shall be a consignment note or other satisfactory evidence that cattle so imported have come direct from one of the above-mentioned countries.

- (2) The provisions of sub-sections (1), (5) and (6) of section 1 hereof shall apply to importations in terms of this section.

3. Any person introducing cattle in contravention of these Regulations, or failing to comply with any of the conditions attached to permits to import, or furnishing applications, declarations, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, testing, destruction or disposal of carcasses, shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties shall have been provided for such offences by the "Animals Diseases Consolidation Ordinance, 1904"; provided, however, that the penalties imposed by these Regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

#### ANNEXURE "A."

##### APPLICATION FOR CATTLE IMPORTATION PERMIT.

1. Applicant's Name and Address.....
2. Number and Class of Cattle to be imported.....
3. Area or Farm and District where Cattle are at present located.....
4. Area or Farm and District to which Cattle are to be moved.....

Applicant's Signature.....

Date.....

Application.....

Permit No.....

#### ANNEXURE "B."

I, ..... residing on the farm ..... in the district of ..... do solemnly and sincerely declare that the ..... (number in writing) animals also enumerated below have been in my possession since birth, and that Lung sickness (Contagious Pleuro-Pneumonia) has not existed amongst any of my cattle, nor on my farm, during the last four years, and that these animals have never been exposed for sale in any public market or stock fair.



Number of Animals ..... Bulls ..... Heifers .....

Breed .....

Seller's Name and Address .....

Purchaser's Name .....

Place in Southern Rhodesia to which animals are being sent .....

And I make this solemn declaration conscientiously believing the same to be true. ....

Declared to at ..... on this ..... day of .....  
before me, .....

Resident Magistrate for the District of .....

No. 127 of 1910.]

[2nd June, 1910.]

### IMPORTATION OF CATTLE FROM NORTH-EASTERN RHODESIA.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that the importation of cattle from North-Eastern Rhodesia may be permitted under the following terms and conditions:—

1. The permission of the Chief Inspector of Cattle be first had and obtained.

2. All cattle shall be introduced by way of the town or port of Feira, which is hereby declared a port of entry.

3. All applications for permission to import shall be accompanied by—

(1) A certificate by a Government Veterinary Surgeon of the territory of origin that—

a. the districts from which they come and through which they pass are free from contagious diseases of animals;

b. the animals in respect of which the application is being made have been examined and are free from any destructive disease.

4. All cattle shall on entry be taken to a quarantine area defined by the Chief Inspector of Cattle, and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, not less than three months.

5. Cattle at Feira at the date of promulgation of this notice may be removed to the quarantine area on permission of the Chief Inspector of Cattle without the certificates detailed above.

6. Any person found introducing cattle in contravention of these regulations, or failing to comply with any of the conditions attached to permits to import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties have been provided for such offence by the "Animals Diseases Consolidation Ordinance, 1904"; provided, however, that the penalties imposed by these regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

## SCHEDULE "A."

## 1. CERTIFICATE UNDER SECTION 3. (1), a.—

I hereby certify that I have examined the following cattle belonging to  
Mr. ....

..... Cows and heifers,  
..... Calves,  
..... Oxen and bulls,

and that the districts from which they come and through which they will pass in this territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signature .....  
Government Veterinary Surgeon.

## 2. CERTIFICATE UNDER SECTION 3. (1), b.—

I hereby certify that I have examined the following cattle belonging to  
Mr. ....

..... Cows and heifers,  
..... Calves,  
..... Oxen and bulls,

In my opinion these animals are free from all destructive diseases.

Signature .....  
Government Veterinary Surgeon.

No. 211 of 1910.]

[4th August, 1910.]

### IMPORTATION OF CATTLE FROM NORTH-WESTERN RHODESIA.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that, notwithstanding the prohibition contained in Government Notice No. 89 of 1908, the importation of cattle from North-Western Rhodesia may be permitted under the following terms and conditions:—

1. The permission of the Chief Inspector of Cattle shall be first had and obtained.

2. All cattle shall be introduced (a) by rail via the Victoria Falls, or (b) by way of the town or port of Feira, which are hereby declared to be ports of entry.

3. All applications for permission to import shall be accompanied by a certificate by a Government Veterinary Surgeon of North-Western Rhodesia that—

- (a) the districts from which they come and through which they pass are free from contagious diseases of animals;
- (b) the animals in respect of which the application is being made have been examined and are free from contagious diseases of animals.

4. All cattle shall on entry be taken, where possible by rail, to such quarantine area and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, but not less than three months.

5. Any person found introducing cattle in contravention of these regulations, or failing to comply with any of the conditions attached to permits to import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all

lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months; provided, however, that the penalties imposed by these regulations shall not exempt from liability to penalties, forfeiture, or destruction, elsewhere provided for

## ANNEXURE "A."

*Certificates under Section 3.*

(a) I hereby certify that I have examined the following cattle belonging to Mr. ....

.....cows and heifers,  
 .....calves,  
 .....oxen and bulls,

and that the districts from which they come and through which they will pass in this Territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signed.....  
 Government Veterinary Surgeon.

(b) I hereby certify that I have examined the following animals belonging to Mr. ....

.....cows and heifers,  
 .....calves,  
 .....oxen and bulls.

In my opinion these animals are free from all destructive diseases.

Signed.....  
 Government Veterinary Surgeon.

NOTE.—All numbers are to be expressed in words.

### IMPORTATION OF STOCK FROM THE PROVINCE OF THE CAPE OF GOOD HOPE.

WITH reference to Departmental Notice of 28th February, 1912, it is hereby notified that the said Notice is cancelled, and importation of stock will now be permitted, in terms of Government Notice No. 110 of 1908, from the Province of the Cape of Good Hope, with the exception of the following districts:—

Komgha  
 East London

Peddie  
 Victoria East  
 Kingwilliamstown  
 Stutterheim  
 Cathcart

Stockenstrom  
 Queenstown (Gwatyu Ward  
 only)  
 Glen Grey  
 Maclear  
 Elliot Slang River  
 Wodehouse  
 Barkly East

No. 375 of 1912.]

[28th November, 1912.

### IMPORTATION OF POULTRY.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," as amended by the "Animals Diseases Amendment Ordinance, 1910," I do hereby declare and make known that the following regulations shall be in force and effect from date of publication hereof:—



(1) All poultry imported by rail shall be inspected by an Inspector or Sub-Inspector at Plumtree, Bulawayo or Umtali.

(2) Should any consignment of poultry shew symptoms of disease, or should such Inspector or Sub-Inspector have reason to believe that any disease exists in, or that infection is likely to be conveyed by such consignment, he may order the detention and isolation of the whole consignment for such period as he may deem necessary.

(3) The Chief Inspector may order the destruction of all poultry which he has reasonable grounds for believing to be diseased or likely to convey infection.

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THE following extract from Live Stock Regulations, printed on page 150 of the South African Railways Official Tariff Book, is published for general guidance :—

Poultry are not accepted by rail unless they are placed in a crate and the following conditions are complied with :—

(1) The size of the crate shall be 3 feet 6 inches by 2 feet 9 inches external floor dimensions; for turkeys and geese the height shall be 30 inches; and for fowls, ducks, and poultry of a like size, the height shall be 20 inches.

(2) Each crate must contain two drinking vessels filled with pure water, such vessels to be not less than five inches in depth, of the unspillable type, one being fixed at opposite corners of the coop.

(3) Each crate shall contain two receptacles for food of a suitable size, filled with suitable food other than whole maize.

(4) The birds must not be over-crowded in the crates, and in no case must there be more than 20 fowls, ducks or other birds of a like size, or ten turkeys or geese.

(5) Different species of birds must not be placed in the same coop.

Unless coops, crates, and the like are strong enough to bear ordinary transit handling, the Administration will not accept responsibility for loss.

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No. 336 of 1911.]

#### RABIES.

[26th October, 1911.]

THE following instructions regarding the treatment of persons bitten by rabid animals are published for general information.

In every case where a person has been bitten by a dog or other animal known or suspected to be rabid, the following precautions are recommended :—

(1) The wound should be immediately and thoroughly cauterised. This, if it does not altogether prevent the disease, delays its onset sufficiently for Pasteur treatment to be successfully applied.

(2) The patient should be sent to Salisbury for treatment at once. Delays are dangerous.

(3) The fullest information should be sent to the Health Department as to date when bitten, locality, fate of dog, and especially reasons for supposing the dog to be mad.

## SUMMARY OF THE GAME LAWS.

Game is divided into three distinct classes, described as follows :—

- (a) Birds and Small Buck.
- (b) Bushbuck, Hartebeest, Impala, Lechwe, Pookoo, Roan and Sable Antelope, Sitatunga, Tsessebe, Waterbuck, and Wildebeest.
- (c) Royal Game, which includes Eland, Elephant, Giraffe, Gemsbok, Hippopotamus, Inyala, Koodoo, Ostrich, Rhinoceros, Springbuck and Zebra.

The shooting season for Class "A" is as follows :—

In Mashonaland :

Birds from 1st May to 30th September.

Small Buck from 1st May to 31st October.

In Matabeleland :

Birds and Small Buck from 1st May to 31st October.

To shoot in Class "A" a licence costing £1 per annum is required. This entitles holders to hunt in both Provinces during the open season.

Class "B."—The season opens on 1st July and closes on 30th November in both Provinces. The licence fee is £25 for non-residents and £5 for persons having their domicile in Southern Rhodesia. This licence entitles the holder to shoot up to 15 head, which number may be increased to a total of 25 upon payment of a further sum of £15 in the one case and £5 in the other.

Class "C."—The Administrator may, if he is satisfied that the animals are actually required for scientific purposes, grant to the holder of a game licence permission to shoot or capture any of the species included in this Class. Such permit requires a £5 stamp. Applications in writing, together with proof of *bona-fides*, should be addressed to the Director of Agriculture.

Game for Farming Purposes.—Permits may be granted for the capture of Eland, Ostrich, Zebra or other animals for the purposes of breeding or farming. Such permits require a stamp of the value of £1 and remain in force for six months. Application, accompanied by a sworn declaration, should be made through the Director of Agriculture or the Civil Commissioner of the district.

Game Injuring Crops.—The occupier of any cultivated land or any person acting under the authority of such occupier, may at any time destroy game actually doing damage on such land.

Elephants on Occupied Farms, Melsetter.—The destruction of Elephants when found on occupied farms on the High Veld in Melsetter District is authorised (*vide* Government Notice No. 284 of 1908).

*Open areas.*

The shooting or capturing of all classes of game with the exception of ostriches and other birds classified as game is permitted within the following areas in the Hartley district and the Sebungwe district until further notice, and Lomagundi district for one year from 1st November, 1913 :—

Hartley District.—From the railway bridge on the Umfuli River, thence north-westwards along the Umfuli River to where it joins the Umniati River, thence southwards along the Umniati River to where it joins the Umsweswe River, thence eastwards along the Umsweswe River up to the drift at the Lydia Mine, thence along the old road from Lydia Mine to Etna Mine and to Inez Mine, thence northwards along the road from Inez Mine to Hartley, thence in the direction of the railway bridge to the starting point on the Umfuli River.

Sebungwe District.—From the confluence of the Sengwe and Lutope Rivers up the Lutope to its headwaters, thence in a south-east and easterly direction following the southern edge of the escarpment, leaving Meare's farm to the south, to the Mafungabusi Peak, thence northwards along the



escarpment to the Njelele River, and down that river to its confluence with the Sanyati River, thence northwards down the Sanyati River to its confluence with the Piriwiri River, thence direct in a north-westerly direction to Picaninyemba, and thence along the footpath to Nenyunka on the Sengwe River, thence southerly up the Sengwe River to its confluence with the Lutope.

Lomagundi District.—An area bounded by a line drawn from the junction of the Angwa and Mkwichi Rivers, in a southerly direction up the Angwa to its junction with the Chumsenga River; thence easterly direct to the junction of the Hunyani and Msitkwe Rivers; thence northerly down the Hunyani to a point opposite Mokore Hill; thence westerly to the junction of the Angwa and Mkwichi Rivers.

Also an area bounded by a line drawn from the junction of the Chumsenga and Angwa Rivers up the Angwa to the point where the Sinoia-Urungwe Road crosses that river; thence along this road in a south-easterly direction to the Hunyani River; thence down that river to its junction with the Mesitkwe River; thence westerly direct to the point first named.

Ostriches, Charter and Chilimanzi Native Districts.—Notice No. 154 of 1914 permits the shooting or capturing of ostriches within fenced areas in the above districts for a period of six months from 2nd April, 1914.

Elephants, Hartley District.—Notice No. 168 of 1914 permits the shooting or capturing of elephants on or within five miles of the farm Walden, in the Hartley District, for a period of one year from 9th April, 1914.

The game specified may be shot in these open areas without a licence.

Game in Class "A" may be hunted in the close season until further notice on private land in the Melsetter district by holders of a licence.

Protected Areas.—No game may be hunted or killed within the limits of the Commonage or Townlands of Bulawayo and within a radius of two miles of the Court House, Gwelo, or within the Urungwe Game Sanctuary, as defined by Government Notice No. 237 of 1906.

"Locust Birds" are strictly protected, *vide* Government Notice No. 390 of 1912.

Export of Game.—No living Game or the Eggs of any Game Birds may be exported beyond the limits of Southern Rhodesia without a written permit.

Shooting on Private Land.—A licence does not entitle the holder thereof to shoot on private land without the permission of the land-owner.

Farmers Shooting Game on their Farms.—By taking out a special £1 licence, farmers may at any time shoot any game on their land. "Game" does not include any birds, except ostriches.

No. 390 of 1912.]

[19th December, 1912.]

#### PROTECTION OF LOCUST BIRDS.

UNDER and by virtue of the powers vested in me by the "Game Law Consolidation Ordinance, 1906," I do hereby declare that the following Locust Birds:—

- (1) Great Locust Bird or White Stork (*Ciconia alba*);
- (2) Lesser Locust Bird or Nordmann's Pratincole (*Glareola melanoptera*);
- (3) Small White Heron or Cattle Egret (*Bubulcus ibis*);
- (4) Wattled Starling (*Dilophus carunculatus*);

are added to class "A" of the said Ordinance, and shall be strictly protected, and not hunted or destroyed, throughout Southern Rhodesia for a period of five years from date hereof.



No. 249 of 1908.]

[27th August, 1908.]

## PROTECTION OF TREES.

IT is hereby notified for public information that any person who shall cut down for use as fuel, or for any other purposes than *bona-fide* farming, mining or manufacturing purposes, or cause to be so cut down the "Wild Westeria" (native name M'Pakwa or M'poea) tree, will be liable to prosecution for contravention of the provisions of the Forest and Herbage Preservation Act, 1859, and upon conviction to a fine not exceeding £100, or to imprisonment with or without hard labour for a term not exceeding six months, or to such fine and imprisonment, or to such imprisonment without a fine.

## AN ORDINANCE

To prohibit the sale and export of the plumage and skins of certain birds.

1. No person shall sell, or offer or expose for sale, or export, or cause or procure to be exported, any plumage or skins of any wild birds, except such birds as are mentioned in the Schedule to this Ordinance, and such as may be added to the said Schedule from time to time by the Administrator by notice in the *Gazette*, and no person shall have in his possession any plumage or skins of wild birds other than those mentioned in the Schedule for the purpose of sale or export; provided that where the Administrator is satisfied that such plumage or skins are to be sold or exported for scientific or educational purposes he may grant a permit in writing authorising such sale or export, and the prohibition contained in this section shall not apply to any sale or exportation so authorised, or to the possession of plumage or skins for such sale or exportation.

2. Any person contravening the provisions of the preceding section shall be liable upon conviction to a fine not exceeding ten pounds, or, in default of payment, to imprisonment, with or without hard labour, for a period not exceeding three months.

3. The Administrator may at any time, by notice in the *Gazette*, withdraw any bird from the Schedule of this Ordinance.

4. This Ordinance may be cited for all purposes as the "Plumage Birds Protection and Preservation Ordinance, 1914."

## SCHEDULE.

Ostriches.

Birds designated as game under the provisions of the "Game Law Consolidation Ordinance, 1906."

No. 234 of 1914.]

[28th May, 1914.]

## ESTABLISHMENT OF A POUND AT UMVUMA.

UNDER and by virtue of the powers vested in me by section 5 of "The Pounds and Trespasses Ordinance, 1903," I do hereby declare and make known that, at the request of the Civil Commissioner, Enkeldoorn, a Pound has been established at Umvuma, in the magisterial district of Charter, and that the said Pound shall be available for the public as from 1st June, 1914.

No. 283 of 1914.]

[9th July, 1914.]

## ESTABLISHMENT OF A POUND AT SINOIA.

UNDER and by virtue of the powers vested in me by section 5 of "The Pounds and Trespasses Ordinance, 1903," I do hereby declare and make known that, at the request of the Civil Commissioner, Salisbury, a Pound has been established at Sinoia, and that the said Pound shall be available for the public as from the 7th July, 1914.

## Department of Posts and Telegraphs, Southern Rhodesia.

Postal Notice No. 12 of 1913.

### AGRICULTURAL PARCELS POST.

IT is hereby notified for public information that, on and after the 1st August, 1909, any article produced, and, if manufactured, produced and manufactured within Southern Rhodesia may be transmitted by Agricultural Parcels Post at the reduced rate of threepence per lb. or fraction thereof, up to a limit of eleven lbs. in weight.

The Agricultural Parcels Post is designed to bring the producer into direct communication with the consumer, and is available for the transmission of :—

|                        |             |              |
|------------------------|-------------|--------------|
| Biscuits               | Dried Meats | Plants       |
| Bread                  | Eggs        | Poultry      |
| Butter                 | Flour       | Seeds        |
| Confectionery          | Flowers     | Sugar        |
| Cigarettes             | Honey       | Tobacco      |
| Dried & Bottled Fruits | Jam         | Wool Samples |

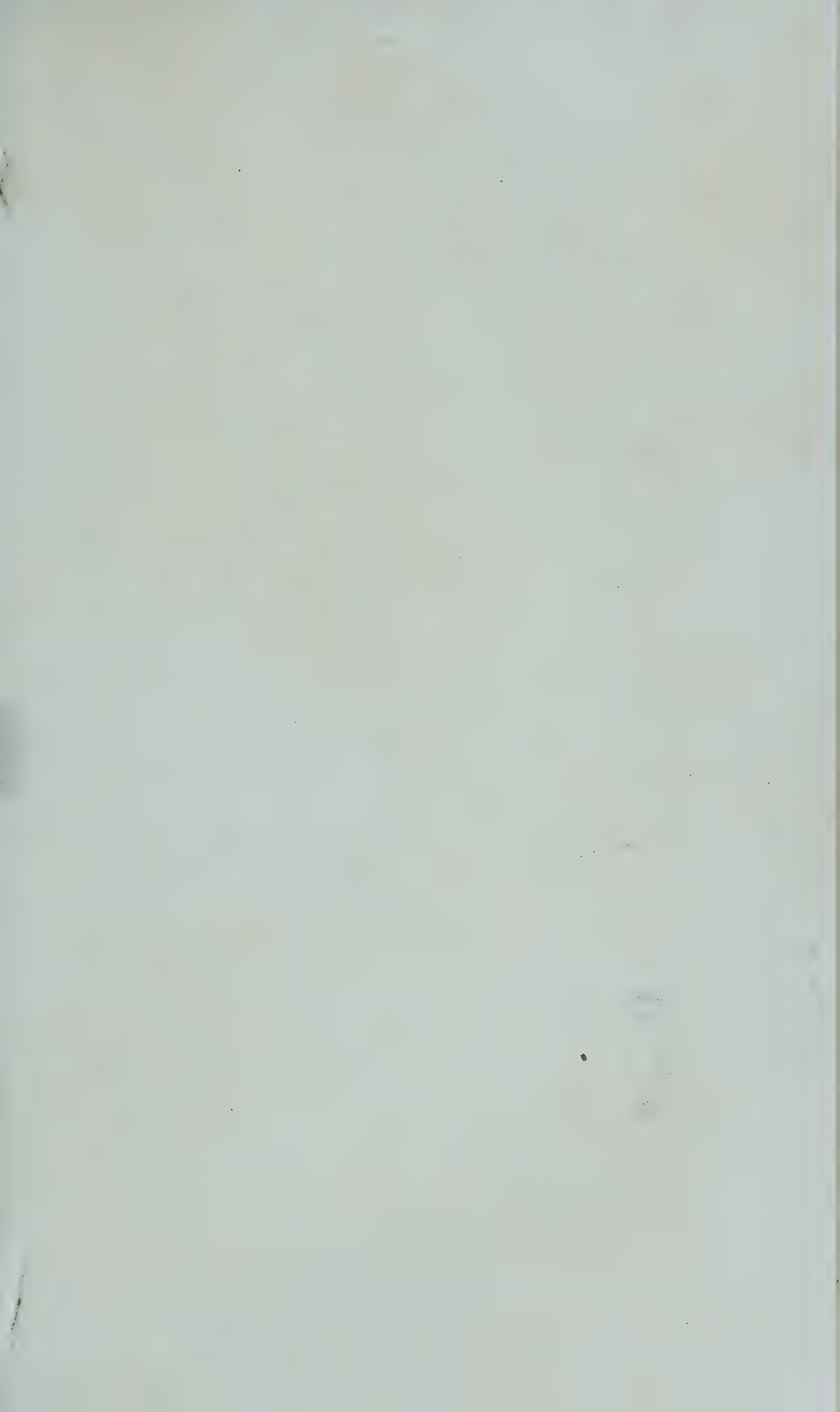
and other articles produced within Southern Rhodesia. It does not extend beyond the borders of Southern Rhodesia.

The senders of articles at the reduced tariff applicable to the Agricultural Parcels Post will be required to sign a declaration that the contents are the *bona fide* produce of Southern Rhodesia.

The limits of size and weight, and the general regulations, are those applicable to the Inland Parcels Post.

G. H. EYRE,  
Postmaster General.

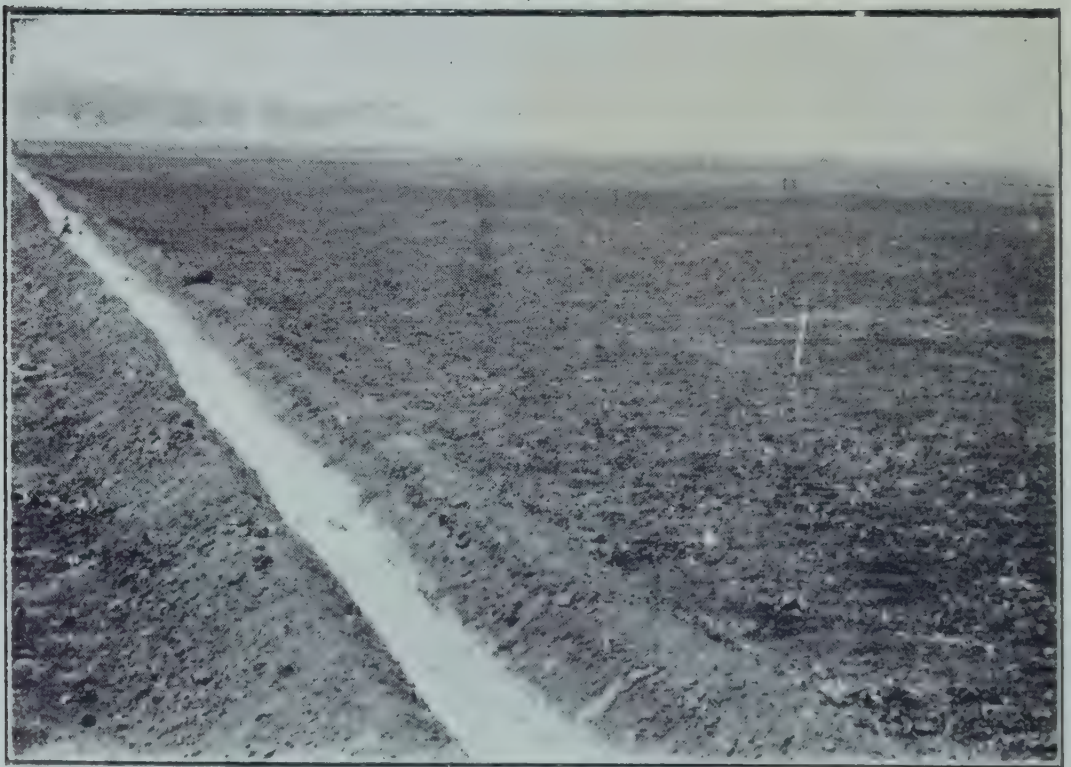
General Post Office, Salisbury,  
31st March, 1913.







Irrigation Scheme, Botanical Experiment Station, Salisbury. Shewing inflow, reservoir and discharge.



Irrigation Scheme, Botanical Experiment Station, Salisbury. Shewing one of the two main furrows and the two acres recently sown down to experiments with lucerne.



# THE RHODESIA Agricultural Journal.

*Edited by the Director of Agriculture,  
assisted by the Staff of the Agricultural Department.*

PUBLISHED BI-MONTHLY.

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## Editorial.

*Correspondence on subjects affecting the farming industry of Southern Rhodesia is invited. Enquiries will be replied to direct, or through the medium of the JOURNAL. An interchange of ideas and suggestions between farmers will be particularly welcomed. Contributions of a suitable nature for insertion in this JOURNAL will be much appreciated. All communications regarding these matters, and advertisements, should be addressed to the Editor, Department of Agriculture, Salisbury.*

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THE WAR.—One of the many results of the present terrible war, whatever the outcome, must inevitably be a shortage of the primary foodstuffs, the production of which throughout Europe will be so much hampered by military operations and national disturbances. In these circumstances it is a patriotic duty as well as an obvious opportunity to take steps to ensure as large a supply as possible of maize, wheat and other produce during the coming season. Recognising this, the Executive of the Rhodesian Agricultural Union, at a meeting held at Gwelo on the 14th August, passed the following resolution:—“That all Agricultural Associations be noti-



fied that, in the opinion of the Executive, it is highly desirable that all farmers should make a special effort to grow as much wheat and maize and other farm products as possible during the coming season as a patriotic duty.' The possibilities of wheat growing have been constantly reiterated in this *Journal*, whether by rust resistant varieties during the summer, or under irrigation or on naturally damp land in winter, and the opportunity now afforded is one to be seized and utilised to the full. In this remote portion of the Empire it is not much that we can do, but the production of foodstuffs on a scale to allow of exports of maize and to reduce our call upon other countries for the bread which will be so much needed at Home may, as stated, be regarded not merely as expedient but as a national obligation.

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**A MONTHLY JOURNAL.**—It is proposed to issue the *Rhodesia Agricultural Journal* from the 1st of January once a month instead of six times a year as hitherto. It is felt that in this way the usefulness of the *Journal* will be enhanced, for its more frequent publication will permit of features of a current nature and articles dealing with farming operations appearing more seasonably. The issue will be of less dimensions than at present, but the total production of contents per annum will be larger. It is not proposed to alter the terms of subscription, which is only 5s. per annum. We would take this opportunity of again asking farmers and others to furnish contributions, correspondence and suggestions which may render the *Journal* more attractive and helpful to our readers.

In connection with the change, the current volume (No. XI.) will include the October and December issues, and volume XII. will commence with the January number.

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**THE BACON FACTORY.**—The Bacon Factory, a picture of which will be seen on the outside cover of this issue, is now practically completed and equipped, and will, it is anticipated, commence operations at the beginning of October. The factory is situated to the west of the Salisbury township, almost under the shadow of the Kopje, and is a substantially-



built brick building, fitted with the most modern machinery. The architect is Mr. D'Arcy Cathcart. A siding has been constructed, and it will therefore be possible to run pigs up to the doors of the factory. The factory will be capable of dealing with 300 pigs per month, but, of course, it will be some little time before pigs to this number will be forthcoming. The price to be paid for pigs of first quality is  $4\frac{1}{2}$ d. per lb. live weight, and an animal under one year old, weighing from 150 lbs. to 200 lbs., sound and in proper condition, is the one required. That there is ample scope for such an enterprise is shewn by the fact that our imports of bacon and hams during 1913 amounted to £21,887. There is every indication that farmers intend supporting the industry, which we are convinced will prove a valuable encouragement to the agricultural industry of this country.

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AGRICULTURAL STATISTICS.—The attention of farmers is called to an article dealing with the scheme for the collection of agricultural statistics in Southern Rhodesia, about to be inaugurated in accordance with the law enacted during the last session of the Legislative Council. The importance of this matter on economic grounds is hard to over-estimate, and the unanimity and eagerness with which the proposal was hailed at the Agricultural Union Congress is a good augury for the support which may be expected to be given to the first attempt to apply the idea. The success of the effort depends primarily on the co-operation of every individual farmer in furnishing returns in respect of his own holding accurately and promptly, and the assistance of all our readers in this matter is earnestly solicited.

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AFRICAN COAST FEVER.—It is with the utmost satisfaction that the announcement can be made that Matabeleland is entirely free from African Coast Fever. There has not been a single case of the disease for upwards of eighteen months, and it has been found possible recently to withdraw the quarantine from all areas where the disease has previously existed. May these happy conditions prove permanent. The position is not so satisfactory in Mashonaland, although all outbreaks are

under control. Besides the instances of the disease near the townships of Salisbury and Umtali, a new outbreak has recently been discovered on the farm Nooitgedacht, near Chipinga, in South Melssetter, in a region where the disease has not been known for years, and with regard to which no recent movement can account for infection. A veterinary surgeon is in charge of the affected area, and it is believed that the disease was diagnosed at its very first appearance, so that further spread is improbable.

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SCAB.—Steadily increasing attention is being given to the breeding of sheep and goats in the Territory, and the desirability of applying more stringently than has in the past been deemed necessary, the provisions of the Animals Diseases Consolidation Ordinance relating to scab has become apparent. In the past flocks of sheep and goats were comparatively few and small, and were kept as a side line for local consumption and barter, but of late farmers have manifested a tendency to go in for larger flocks of wool-bearing sheep in place of Africander or Persian cross-breds, and certain districts are coming to the front on account of the success which is attending these efforts. In some districts where small stock has always been more in evidence active measures for the suppression of scab have long been enforced, and it is now felt—and representations have been made to the Government by those interested—that the law relating to scab should be more rigorously enforced in all parts of the country, with a view to at least reducing, if not entirely eradicating, the disease.

Steps to this end have been taken, and it may be well, therefore, to remind owners of small stock that they are under the obligation of cleansing their flocks if infected with this disease, and that the movement of sheep or goats affected with scab is illegal. It is hoped that the public concerned will co-operate with the authorities and render the application of these measures genuinely effective.

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THE LATE MR. D. R. CHATTERLEY.—It was with much regret that the news of the sudden death of Mr. Chatterley,

M.R.C.V.S., was received by his colleagues and by the public who had known him during the four years he was in Rhodesia. On the expiry of his agreement, and on account of ill-health, he was on his way Home when death overtook him whilst travelling to Capetown, and he was buried at De Aar. By this sad and untimely event a useful career is cut short, and his death will be widely deplored in Rhodesia.

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IMPORTATION OF STOCK.—Mr. Joseph Buck, M.R.C.V.S., Kimberley, has been appointed an Inspector of Live Stock for Southern Rhodesia. Mr. Buck will be stationed at Kimberley, and will examine all stock passing through that town to Rhodesia as well as local stock intended for importation.

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THE TOBACCO EXPERT.—We regret to announce that Mr. J. W. Lewis has elected to sever his connection with the Department of Agriculture and has returned to his own country. During his residence in Rhodesia his services have been of much value to tobacco growers, and he has been indefatigable in visiting and advising them in the culture and curing of tobacco on Virginian lines. In the preparation of the handbook of tobacco growing his experience and thorough knowledge of the subject were of the greatest use, and his willingness to help at all times has secured him the grateful appreciation of many friends. It is hoped that the vacancy thus caused may be filled at an early date.

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APPOINTMENT OF A CITRUS EXPERT.—In accordance with an undertaking made during the recent session of the Legislative Council, the appointment has been made, in the person of Mr. A. G. Turner, of a citrus expert attached to the Department of Agriculture, and available to the farming community of Southern Rhodesia for the purpose of giving advice and assistance on all matters relating to the citrus industry. The country is beginning to realise its possibilities in these directions, and it is highly desirable that at this stage orange growers, present and prospective, should have the benefit of



skilled instruction in the establishment and early treatment of orange groves. The number of trees which will come into bearing shortly is considerable, and it is necessary to obtain the best advice in regard to the sorting, packing and the organisation of an export trade, as well as to the development of local markets. There is room and need also for experimental work connected with citrus culture and with regard to the possibilities of growing other fruits on a commercial scale.

The services which have been rendered during the past two years to the industry by Mr. C. E. Farmer have proved of very great value, and have done much to encourage farmers to take up citrus growing. His numerous articles in the pages of this *Journal* have been very helpful and are much appreciated, as is testified by the demand for them reprinted in bulletin form. Mr. Farmer's other duties, however, prevent him from attending to the many requests that reach him for visits of advice to farmers and for demonstrations, and it is the great success of his pioneer efforts in this cause that has led to the necessity of a special appointment. •

Besides experience of fruit farming in California and British Columbia, extending over ten years, and a similar period in the Transvaal and Cape Colony, Mr. Turner has the great advantage of a thorough practical knowledge of the commercial side of the question—packing, grading, marketing and buying—so that the organisation of exports of citrus fruits can be dealt with by him as a familiar subject, whilst his long experience and familiarity with other classes of fruits are also likely to stand the farmers of Rhodesia in good stead.

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ASSISTANT AGRICULTURAL ENGINEER.—The staff of the Department of Agriculture has been further strengthened by the appointment of an assistant to the Agricultural Engineer, an addition very much needed on account of the numerous applications for services quite beyond the powers of Mr. Watt to keep up with, and, further, owing to the applications now being received for the apportioning of public water in terms of the Water Ordinance. To this end, the services have been obtained of Mr. C. L. Robertson, B.A., hitherto Assistant Hydrographic Surveyor in the Irrigation Department of the

Union, who is, therefore, exceptionally qualified for the tasks with which he will specially be concerned in Rhodesia. He commences his duties on 1st October, and will act for the Agricultural Engineer during the latter officer's absence at Home on leave.

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THE MARANDELLAS AGRICULTURAL SHOW.—The last show to be held during the season was that at Marandellas, on 23rd to 25th July. This meeting, which partook of the nature of a farmers' gala, was a purely local event, yet it was one of much instructive benefit, both to competitors and onlookers, as everyone present was more or less directly interested in farming and anxious to shew or to learn what the district could do. There were about one hundred head of cattle shewn, and, although premier honours were carried off by Mr. A. W. Partridge of Lendy, yet there was good competition and some animals of excellent quality were brought forward.

A particularly instructive exhibit was that made by Mr. Nalty, of various products from the farm Chudleigh, proving how many products can be grown in the district which has hitherto devoted attention unduly to one line—tobacco.

The Nengubu Mission made a striking industrial exhibit of leather work, saddlery and harness made by the natives at the Institution, which reflected great credit on teachers and pupils alike, supplying, as it does, locally manufactured articles of general utility and in constant demand at moderate prices. This enterprise is to be commended and deserves every encouragement. Boys trained to repair harness and leather goods would be a boon on many a farm.

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BULAWAYO SHOW AWARDS.—In an article published in the last issue of the *Journal*, dealing with the awards at the Bulawayo Show, we omitted to mention the B.S.A. Company's Shorthorn cow "Pearl," which gained precedence as champion Shorthorn cow and best female in the yard. This award was adversely criticised at the time, as many well known breeders contended that the cow was barren, and was only worth what she would fetch at the block. We are informed by Mr. Richard

Walsh that the cow has since given birth to a fine bull calf by the Shorthorn bull "St. David," bred by the Duke of Northumberland, thus belying the adverse opinions of the critics, and justifying the finding of the judges.

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**RAILWAY RATE FOR FRESH FRUIT.**—The rate for fresh fruit, minimum 50 lbs., when conveyed over the lines of the Beira and Mashonaland and Rhodesia Railways, has been reduced to 2d. per ton per mile, plus 3s. 4d. per ton terminal. The rates from Beira at present shewn on page 103, clause 7 of Goods Tariff Book No. 7, are cancelled with the exception of those shewn to Broken Hill, Bulawayo, Congo Border and Livingstone, which still operate. Simultaneously the fees for inspection of fruit imported into Rhodesia have been reduced to 3d. per 10 cases, whether of one sort or mixed, with a minimum charge of 1s. per consignment, a step which is calculated to encourage the importation of fresh fruit whilst safeguarding the country from the introduction of insects and fungoid pests.

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**THE OIL FACTORY.**—It is authoritatively announced that the oil factory, in course of erection by the B.S.A. Company, will be completed in ample time for next season's crop. Owing to the war there has been some slight delay in the shipment of the machinery, but this will not prevent the factory being in working order before our next crop is ready. This should be welcome news to many farmers who have been anxiously awaiting definite information before deciding to plant any considerable acreage to oil crops, such as linseed, monkey nuts, sunflower, or castor bean.

It has been arranged that in the first instance and tentatively the prices will, subject to market fluctuations, be as follows:—Ground-nuts 7s. 2d. per bag of 83 lbs.; linseed 2d. per lb.; castor beans 1d. per lb.; and sunflower and cotton seeds  $\frac{3}{4}$ d. per lb., delivered at Salisbury.

Further information regarding this subject may be had on application to the Commercial Representative, B.S.A. Company, Bulawayo.



IRRIGATION EXPERIMENTS.--A new sphere of activity has been recently opened up to the Department of Agriculture by the provision of facilities for experimental work in connection with irrigation at the Experimental Station at Salisbury. Up to the present the Government Experiment Farms have been essentially dryland stations, and the results obtained, therefore, apply only to crops produced under rainfall conditions.

Arrangements have been made with the Salisbury Municipality for the supply of 3,000,000 gallons of water per annum from the Salisbury dam. It is now possible to place from 3 to 5 acres of land under irrigation.

While this amount of irrigable land is not very large, it is yet sufficient to initiate the work of an irrigated experiment station, and the information obtained, it is anticipated, will be most valuable. The acreage under water will be devoted mainly to trials with lucerne, wheat, barley, oats, other fodder crops and winter pasture grasses. Various problems of liming, manuring, inoculating with bacteria cultures, seeding and irrigating lucerne are to be investigated, while plant breeding by means of selection and hybridisation during the winter months will now be rendered possible. At the date of writing,  $3\frac{1}{2}$  acres have already been seeded to lucerne and other crops, and good germinations have been obtained. One of the most important features of the research will be to ascertain the quantity of water required to raise various winter crops under irrigation on this class of soil; also the frequency and stages of growth at which such water can most profitably be applied. These various lines of work will do much to increase the interest of the Station to farmers paying visits of inspection during the dry season. The two illustrations given here shew the manner in which the water from the main pipes is aerated before use and the land lying below the main water furrows.

## Collection of Agricultural Statistics in Southern Rhodesia.

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By ERIC A. NOBBS, Ph.D., B.Sc., Director of Agriculture.

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It will be fresh in the public memory that at the last Congress of the Agricultural Union, at Bulawayo, a resolution was moved by Mr. Wilson, and seconded by Dr. Peall, proposing "that the Government be asked to undertake the formation of a Statistical Bureau, more especially to deal with agricultural produce and live stock; and that legislation be enacted, rendering returns by farmers compulsory." After an interesting discussion in which the objects of the resolution, and the methods of giving it effect, were thoroughly thrashed out, it was carried unanimously.

During the debate, Mr. Wilson indicated the practical value which there would be to every individual farmer, to the industry as a whole, and to the entire community, in being authoritatively informed as to the quantity of, for instance, maize, in the country, or likely to be produced at any time. In subsequent discussion, the need of information with regard to live stock and animal products, and other crops as well as maize, was insisted upon. The failure of previous efforts in this direction was referred to, and the difficulty of securing reliable information, without legislative enactment, was made clear. While it was realised that reliable statistics could only be compiled from accurate information supplied by every individual concerned, the necessity of treating all such individual returns as strictly confidential was repeatedly emphasised; and, after various methods of collecting the desired information had been discussed, it became apparent that the only acceptable way would be by means of forms issued to each farmer or other person concerned, which should then be filled in, sealed and returned through the post.

In due course, the resolution of the Agricultural Union received sympathetic consideration by the Government, and, during the last session of the Legislative Council, an Ordinance dealing with the matter was introduced and became law. On account of the interest manifested in the subject in farming circles, the debates on the measure in the Council were published in the June issue of this *Journal* (Vol. XI., pages 710-727), so that there is no occasion to repeat here the arguments there set forth. Suffice it to say that the Council received the proposals as favourably as did the Agricultural Union, and the sanction of the Legislature was given to the principle of conferring statutory powers to collect the desired information, while at the same time safeguarding the absolute secrecy of individual returns.

The importance of agriculture in Rhodesia now warrants that, as has been the case with mining for many years past, reliable information, relating to the extent and progress of the industry, should be regularly and systematically collected and published for the information of the farming community and the public at large. Farmers themselves, first and foremost, will be directly benefited by the publication of reliable information as to the quantities of produce likely to be available for the markets: a foreknowledge of which will—by enabling them to make due arrangements beforehand for its disposal to the best advantage—tend to regulate the price and eliminate the speculative element as regards both production and trade, and to ensure to the grower the full and equitable reward for his labour and enterprise.

Similarly, too, it is essential that large employers of labour, such as mining companies, and co-operative societies and dealers in all kinds of produce, who may wish to import or export certain foodstuffs, should know what the prospects are locally in regard to the supply or the disposal of such commodities: that the Railways should have advice as to prospective demands for transportation: that merchants should have data as to the pastoral and agricultural prospects in the various parts of the country which will enable them to forecast the probable expansion or restriction of farmers' demands for general merchandise, owing to good or bad seasons; and so on through every branch of our national economy.



The Government has decided that the actual collection of statistics relating to the agricultural and pastoral industry of Southern Rhodesia may now be proceeded with, and has charged the Department of Agriculture with this task. Particulars regarding the *modus operandi* proposed for the collection of these statistics are here published; firstly, with a view to indicating their scope and nature, so that farmers may be prepared with the information that will be required of them; secondly, in order to allay any feelings of doubt or uncertainty which may exist; and, lastly, in the hope that all interested will assist by offering suggestions which may occur to them with a view to improvement.

Regulations under Government Notice No. 399 have been issued, entrusting the duty of collecting these statistics to the Director of Agriculture, and prescribing, as persons who shall furnish returns, all those in charge of farms or estates, whether as owners, lessees, managers, servants, or occupiers, or acting on behalf of such persons. The forms to be filled in are set forth, and the penalties for failure to do so at the proper time are fixed. Before any returns at all can be asked for, it has been necessary to compile, from various sources, a complete list of the farmers in the Territory, together with their postal addresses. This was less simple than at first sight might appear, as so many farms are occupied by persons other than their registered owners, whilst other farms, though duly registered as regards ownership, are not occupied at all; and yet again farms are so often changing hands; all of which has necessitated the most careful checking in each case. This work is now in hand and the numbers of farmers in each district will thus be the first definite fact ascertained: though, owing to the changes that are continually taking place, the lists will require frequent revision at regular intervals in order to keep them up to date. In this connection, it is earnestly hoped that any farmer, finding that his name has been inadvertently omitted, will at once communicate with the Director of Agriculture, giving both the name of his farm and its full postal address. Similarly, it will be much appreciated if notification be sent of changes of address or occupancy.

At the outset the returns are, in accordance with the opinion expressed by the Agricultural Union, to be limited to

live stock, maize and tobacco; later, as the system develops and farmers become familiar with it, other items of interest, such as the acreage and yield of potatoes, onions, ground-nuts, wheat, oranges and other fruit, and the area of irrigated land and timber plantations, will be added.

As regards live stock, some classification is called for, so that the fullest benefit may result from the information given. To this end, cattle are grouped under four heads, viz., cows and heifers over one year old, heifer calves under one year old, bulls in use for stud purposes, and, finally, oxen of all ages and bull calves. The numbers, without distinction as to age or sex, are required in the case of horses, mules, donkeys, pigs, poultry and goats; while sheep are divided into two classes—merinos, and all other. The quantity of animal products sold during the previous twelve months, in the form of cream, butter and eggs, should give us some idea of how far we are meeting our own requirements in this respect, and what proportion local production bears to importation. Wool sold will indicate the magnitude and, as time goes on, the growth of this branch of stock farming. As regards live stock and animal products, a distinction is made between that owned by Europeans and by natives. Special steps will be taken to obtain returns from commonages, and from transport riders and wood contractors owning draught animals working on roads or on unoccupied land, and not reached by the ordinary methods applicable to farmers proper. The acreage and yield of maize and tobacco are asked for; and, of the latter, the quantity reserved for home consumption and seed is also sought, from which, by deduction, the amount available for sale can readily be ascertained.

The procedure that has been adopted for the actual collection of the statistics is very simple. Printed forms, ready addressed for return to the Department of Agriculture, will be sent out to all farmers simultaneously, to be by them filled in, signed, sealed by means of the adhesive strip, and, returned through the post. Postage stamps are not required. As received, the particulars will be extracted and collated under the various headings, firstly for each district, and then for the Territory as a whole. It is this collated information which will be published; but it will be readily realised that,



to render these totals reliable, it is essential that every individual farmer shall assist by not only forwarding his returns promptly, but also by ensuring that the figures he furnishes shall be both complete and accurate. It is obvious that the trustworthiness and accuracy, as a whole, of the estimates, as well as of the actual yields of the crops and of the live stock statistics, must depend upon the accuracy of each individual return sent in.

It is conceivable that prejudice or a want of adequate realisation of the general benefit to be derived from a proper knowledge of our agricultural resources may here and there lead individuals to refrain from or to be dilatory in furnishing returns. The unfortunate effect of such a course on the part of even a small number of persons is perhaps not fully realised without some explanation. The total figures for a district cannot be arrived at until every return has been received; and the same holds true for the whole Territory. The labour of compiling the returns is needlessly increased. And it must be borne in mind that no general average can be struck in respect of forms not returned, as there is no certainty as to whether the defaulting cases represent large or small acreages, many or few head of stock. Thus any failure to furnish the prescribed returns, or carelessness in regard to the information given, must detract from the accuracy and completeness of the statistics for the whole Territory; and it is this view of the matter which, it is hoped, will appeal to every individual.

It is obviously of great importance that the information collected should be made widely public at the earliest possible moment, as its value diminishes as time goes on, especially in the case of perishable and immediately marketable commodities. Failure or dilatoriness on the part of a few persons, in returning the forms issued, is thus likely to diminish materially the value of the whole undertaking, and to render more or less abortive the efforts of all those who have, perhaps, been at some pains to furnish their returns promptly and conscientiously. Incomplete or inaccurate information is worth but little. It is for these reasons that failure to furnish information is rendered a statutory offence, with additional penalties for continued default. At the same time, however, it is recognised that the successful working of any system of collec-



tion of statistics must be based upon the goodwill of those who supply the first-hand particulars, from which the totals are compiled: and the punctual and precise filling in of the facts and figures asked for is to be regarded as a national duty, for the public good, and in no way as a burden or an imposition.

In view of the manner in which the proposal has been made and received in Rhodesia, there are no grounds to fear that serious objection will be raised to the practical application of the principles already so generally approved.

Particulars regarding live stock will be asked for only once in the year; and, indeed, generally—with a view to imposing the minimum of trouble on individual farmers and others furnishing the returns—every effort will be made to collect information on several subjects simultaneously, and at stated seasons. Owing to the date at which the scheme has been put into operation, it is proposed this first year to obtain returns, with regard to the last harvest and the numbers of live stock in the country, in time for publication, if possible, before the end of the year. In subsequent years, however, it is intended to seek somewhat fuller information regarding crops; first as to the acreage sown, as soon after the planting season as possible; then, later on, as to the prospects of the harvest; and, finally, as to the yield actually obtained, as soon as this can be definitely known. In this connection it has been shewn already how very desirable it is in the farmers' interest, as well as in that of the community generally, to have forecasts of the quantities likely to be available after harvest, as early as possible: and to this end, it is proposed to call, in the month of February, for returns of the acreages sown to maize and planted to tobacco. From these a preliminary estimate of the possible harvest can be formed, and, as the favourable-ness or otherwise of the season is observed, and the meteorological returns from all over the country are gathered, the forecast may be amended or confirmed. The later reports of the prospects of each farmer's crops should furnish a valuable confirmation of and check on the general estimate, and should enable us to make as accurate a forecast of the year's crop as is possible before the actual figures for the yield are obtained at harvest time. Particulars of the tobacco crop will normally

be available about the middle of May, and of the maize crop in August or September, according to the season.

Although the Cape morgen is officially recognised, the unit of area usually spoken of in this country by farmers is the Imperial acre of 4,840 square yards. As a matter of fact, farmers very rarely know precisely the amount of land they have under any particular crop. Furthermore, it is the exception that any land is exactly rectangular. Opportunity for errors thus creeps in, and it will be necessary for individuals to be at some pains to ascertain, as nearly as may be, the acreages of the crops asked for. To this end the cultivated lands should be measured or at least stepped off. The length multiplied by the breadth in yards, or paces, and divided by 4,840 will give the area in acres. Allowances must be made in the case of irregularly shaped areas. A useful figure to remember is that roughly 70 x 70 yards or paces makes an acre. Apart from the question of statistical returns, it is well worth while to ascertain accurately the area of any piece of land of permanent dimensions, which is no longer in process of being added to from year to year, and to preserve a note of the acreage for future reference; as, for instance, in connection with the time and labour needed for ploughing, cultivating or harvesting it, or the application of kraal manure, lime, or artificial fertilisers.

The measures used are those commonly adopted for commercial practice, that is to say—for maize, the bag of 203 lbs. gross; for tobacco, butter and wool, the pound net; for cream, the gallon; and for eggs, the dozen.

It may be well once again to emphasise the assurances given previously that the returns of individual farmers will be treated as strictly confidential and will not be published; nor will any use be made of them other than collating them into one return, first for the whole district and eventually for the Territory; also, that the returns are not connected in any way with taxation, but are required solely for the purpose of obtaining statistical information respecting agriculture and live stock in Southern Rhodesia. In this connection it may not be out of place to point out that, as regards the confidential nature of these returns, the officials of the Depart-

ment dealing with them are themselves bound by the Ordinance, under very severe penalties, to keep the secrecy of individual returns absolutely inviolate.

Suggestions from farmers or others with knowledge of local conditions, or with ideas which may be of value in carrying out these proposals, will be welcomed. It is obviously desirable to attain the maximum of accuracy with the minimum of trouble and labour, and as expeditiously as circumstances will allow.

This first collection must be regarded as something of an experiment, and will no doubt bring to light details regarding the operation of the system which will prove valuable guides for the future. As great a degree of accuracy as possible will be aimed at from the commencement, and every endeavour made to render the statistics, as far as they go, complete and trustworthy.

Although armed with powers to enforce compliance, it is not anticipated there will be any call to exercise them. The Government relies on the public spirit of farmers throughout Rhodesia to assist in this important work. Many farmers are already in a position, from records kept for their own purposes, to foretell the prospects or give the results of their several undertakings—perhaps to a greater extent even than is now being asked of them. There are, however, others who are not so placed; and these will find the collection of the figures both interesting and beneficial to themselves, whilst at the same time they will be rendering a valuable service to the community, by assisting in the efforts to secure reliable and complete statistics of the country's agricultural and pastoral resources.



## Some Notes on the Systematic Dipping of Stock.

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By C. R. EDMONDS, Assistant Chief Veterinary Surgeon, and  
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logist, Southern Rhodesia.

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The systematic dipping of stock has become a matter of such importance to every Rhodesian farmer that a few notes on the subject may be of interest to our readers.

Although the dipping of sheep for the eradication of scab has been practised in South Africa for many years, it was not until the discovery that East Coast Fever was transmitted by ticks that the dipping of cattle was seriously resorted to as a means of suppressing disease.

The practical results obtained by Mr. Joseph Baynes, the pioneer of dipping in Natal, drew attention to the value of regular dipping and prompted others to adopt it, but it was only when the experiments by Theiler, Lounsbury, and especially Watkins-Pitchford, had placed the principles of "systematic dipping" on a sound and scientific basis that its full value was obtained and generally recognised. Thus, for several years after the introduction of East Coast Fever into Rhodesia, the numbers of privately-owned tanks did not exceed a dozen, and those constructed by the Government were only met with at the chief centres, such as Salisbury, Umtali, Gwelo, Bulawayo, etc.

The regulations for the control of East Coast Fever permitted a limited movement of cattle under certain conditions, the chief of which was that such cattle were not allowed on any road, public outspan, commonage or any property other than that of the owner unless they were free from ticks, or

unless they had been effectively cleansed by dipping, spraying or other process within fourteen days of being allowed on such road or other place. As the law stands at the present time, any beast having ten or more ticks on it is not considered clean, and its owner is liable to a fine or imprisonment.

Later, to encourage the erection of dipping tanks, the Government made a grant in aid on the £ for £ principle. The total amount up to £50 was paid to approved applicants after the tank had been inspected by an official appointed for the purpose and had been found suitable, and on production of receipted accounts in support of the claim. These grants have now been discontinued.

It soon became apparent to those who regularly dipped that the reduction in the number of ticks was followed by a marked improvement in the condition of the cattle, and more especially of the young animals, which as a result were more healthy, developed more quickly, and were less subject to the common calf ailments, such as scour and pneumonia.

The scientific work of the veterinarians confirmed and explained these observations, and shewed how these favourable results could best be obtained. As a result, there are now some 424 tanks in Southern Rhodesia, and it is worthy of record that one of these has been subscribed for by the natives themselves; so obvious are the benefits arising from systematic dipping.

At the present time most intelligent stockowners object to cattle which have not been regularly dipped crossing their land, and regard the owner of tick-infested animals not only as a bad stockowner, but as a menace to his neighbours.

The feeling in favour of systematic dipping is so strong that during the last session of the Legislative Council an Ordinance was promulgated (No. 27 of 1914) providing for the periodic dipping of cattle and other animals on the commonages of towns and villages, and enabling compulsory dipping to be applied in any rural area where such is the wish of the majority. The Ordinance is fully discussed in a special article in the previous issue of this *Journal*, which should be carefully studied.

The term "systematic" or "periodic" dipping implies the immersion of cattle and other domestic animals in certain solutions destructive to ticks and other parasites at certain intervals, based upon a knowledge of the life cycle and habits of these parasites. Under the Ordinance no hard and fast rule is laid down as to the length of the intervals, which will no doubt depend upon the object which it is sought to obtain. Different diseases are transmitted by different species of ticks, and a system which will exterminate one may not be equally successful against another; for example, dipping at intervals of a fortnight may eliminate redwater but will not avail against East Coast Fever, for reasons which may be more fully explained.

Redwater of cattle is caused by a microscopic animal parasite present in the red-blood-corpuscles, which is introduced by the bite of the common blue tick (*Margaropus decoloratus*.) The female tick, having engorged on an infected animal, drops off and seeks shelter, where after a few days she lays from 1,000 to 4,000 eggs. The delay in the beginning of egg-laying is longer in winter than in summer, and the time elapsing between the laying of the first and the last egg by a female is, in warm weather, only a few days, whereas in winter it may extend over a period of several weeks. From these eggs the larval or "seed" ticks hatch—little creatures considerably smaller than a pin's head, and having three pairs of legs. In winter the incubation is almost suspended, and months may elapse before hatching takes place, but under favourable conditions of warmth and moisture may be completed in as short a time as thirty-six days. If the mother tick has fed on an infected animal, the redwater parasite is passed through the eggs and is transmitted by the larvæ in the act of feeding. These seed ticks are, however, capable of existing without food for several months. In summer they are most active, and make their way to the heads of grasses and attach themselves to animals which come within reach. When they succeed in getting on to the skin of an appropriate host they speedily attach themselves. It is a well-known fact that certain animals are more subject to tick infestation than others: it would appear that the ticks possess a power of selection. Thus sick animals with a dry staring coat are preferred to those with a healthy sleek skin, and as



a rule imported stock are more infested by ticks than indigenous animals. Having attached themselves, the young larvæ suck blood and become fully engorged, after which follows a period of quiescence, during which the tick undergoes a moult, and emerges from the old skin as a nymph with four pairs of legs. The young nymph sucks blood, swells, undergoes a resting period and then moults. As the result of the second moult the tick has become an adult, male or female. Having been fertilised by the male, the females have a third drink of blood, drop and deposit their eggs.

According to the manner in which the life-cycle is completed, one can divide ticks into two classes—

- (1) the continuous feeders, and
- (2) the interrupted feeders.

The blue tick belongs to the first class, that is to say, *all the stages from the larva up to the engorged fertilised female are passed on the same individual animal, the period occupied in the process being about twenty-one days.*

To recapitulate: the blue tick, having engorged on blood containing redwater parasites, transmits them through her many hundreds of eggs to the larvæ, each of which is capable of infecting a susceptible animal to which it attaches to feed, and becomes a nymph, which again feeds and becomes an adult; the period occupied by these changes on the ox being about three weeks.

The practical application of this knowledge is that during these three weeks the tick may be caught and destroyed by a system of fortnightly dipping. And since the blue tick is the principal disseminator of redwater, with its destruction this disease will be considerably reduced, if not entirely eliminated. This is what has happened on Bulawayo commonage and several farms as the result of systematic dipping.

In the case of East Coast Fever, quite a different method of transmission obtains. The tick mainly concerned in the dissemination of this disease is the brown tick (*Rhipicephalus appendiculatus*), although other species, such as the red-legged tick (*Rhipicephalus evertsi*) and the black-pitted tick (*Rhipicephalus simus*), have also been incriminated.

This disease, like redwater, is also due to a microscopic animal parasite, which at the height of the attack is found in a very high proportion of the red corpuscles of the infected animal. Before death it is quite common to find 80 to 90 per cent. of the corpuscles invaded, and sometimes as many as a dozen parasites in one corpuscle. But unlike redwater *this parasite is not passed through the eggs* of the adult tick which has imbibed such blood, and is therefore not transmitted by the larvæ hatching from such eggs.

Again, while the blue tick is, as we have said, a continuous feeder, the brown tick belongs to the second class, or interrupted feeders, and behaves in quite a different way.

The eggs of the brown tick may hatch in as short a time as 28 days after they are laid, but will remain dormant for several months until weather conditions are favourable for the hatching of the larvæ, which, having attached to an ox, feed, but, unlike the blue tick, drop off in as short a period as three to eight days, and remain off some sixteen to twenty-one days, when they are ready as nymphs for a second feed. The nymphs, having found a suitable host, may also become engorged in three to eight days, and again drop off and undergo a period of quiescence of about three weeks. Then the adult male and female emerge and seek a third host, on which the female may remain from four to seven days. The adult can live as long as fourteen months off the host, but the engorged and fertilised female may commence to lay eggs about a week after dropping.

Thus we see that the brown tick is an interrupted feeder, that is to say, it attaches to three hosts during its development from larva to adult, and it often happens that the period spent on the host is not longer than three days.

Again, the transmission of East Coast Fever by the tick differs from that of redwater. In the first place, *the parasite does not pass through the egg to the larva*, so that the larva cannot transmit the disease; but when a healthy non-infected larva sucks blood from an ox containing the parasites, it is capable of infecting the next ox it attaches to as a nymph. Similarly, a previously healthy nymph may become infected by feeding on an East Coast Fever ox, and the disease is then transmitted when the adult attaches to a susceptible animal.

The red sections indicate the hosts to which they attach, and the blue the diseases transmitted in the different stages.

## BLUE TICK

| ADULT                            | EGG                 | LARVA                         | NYMPH             | ADULT |
|----------------------------------|---------------------|-------------------------------|-------------------|-------|
| Can live six months off host.    | Hatch in 3-6 weeks. | Can live six months off host. |                   |       |
| Lays eggs 5 days after dropping. |                     |                               | One host 21 days. |       |
|                                  | Red Water.          |                               |                   |       |

## RED-LEGGED TICK

|  |                   |                                 |                   |                   |                   |
|--|-------------------|---------------------------------|-------------------|-------------------|-------------------|
|  | Hatch in 30 days. | Can live seven months off host. | 1st host 15 days. | Off host 24 days. | 2nd.              |
|  |                   |                                 |                   |                   |                   |
|  | Spirochaetosis.   |                                 |                   |                   | Biliary Fever.    |
|  |                   |                                 |                   |                   | Spirochaetosis.   |
|  |                   |                                 |                   |                   | East Coast Fever. |

## BROWN TICK

|                                    |                              |                                 |                               |               |
|------------------------------------|------------------------------|---------------------------------|-------------------------------|---------------|
| Can live fourteen months off host. | Hatch in 28 days (2 months). | Can live seven months off host. | Can live six months off host. |               |
| Lays eggs 6 days after dropping.   |                              | 1st 3-8 days.                   | 2nd 3-8 days.                 | 3rd 4-7 days. |
|                                    |                              | Off host 16-21 days.            | Off host 18 days.             |               |
|                                    |                              | E.C.F.                          | E.C.F.                        | E.C.F.        |





Nuttall and Hindle have recently conducted experiments which shew that 100 per cent. of ticks which imbibe the parasite prove infective, and that ticks are non-infective during the first two days after their becoming attached to a host. Probably the parasites contained within the unfed infected tick are unable to complete their development until it has begun to ingest blood. After the tick has commenced feeding, the influx of blood starts some development, resulting in the infected tick becoming infective only after an incubation period of two days. But should an infective tick attach to a non-susceptible host—and it should be remembered that only bovines are susceptible to East Coast Fever—in biting it discharges its virus without effect, and thereafter becomes harmless in its future stages. But if an infected tick attaches to a non-susceptible host on which it feeds, even as long as three days, and is accidentally brushed off and later completes its feed on an ox, it is still infective, unless the interval between such feeds has exceeded seventeen days. That is to say, there is a danger of the transportation of infective ticks by non-susceptible animals.

To recapitulate: the parasite of East Coast Fever is not passed through the egg of the brown tick, which is an interrupted feeder, the larva, nymph and adult feeding on separate hosts, but sometimes remaining no longer than three days on the host. The parasite of East Coast Fever, having been taken up by a larva, is transmitted to a susceptible ox by the nymph, or, if taken up by the nymph, is transmitted by the adult, which may remain as long as fourteen months without feeding.

Another disease which is transmitted by ticks is Biliary Fever of the horse, which is also caused by a blood parasite introduced by the bite of the red-legged tick (*Rhipicephalus evertsi*). This species has also been accused of transmitting East Coast Fever and spirochaetosis of cattle, so that it may be well to give a brief outline of its life cycle.

The adult can deposit several thousand eggs, from which the larvæ may emerge under favourable conditions in about a month. These larvæ can live as long as seven months without feeding: but, having found a host, feed and remain on the same animal as a nymph and drop off after a fortnight. After

a quiescent period of about twenty-four days, the adult emerges and is ready to attach to a second host—another example of “interrupted feeding.” These ticks are generally met with in the ear and beneath the tail, and are found on cattle, sheep, horses, mules, donkeys, goats and many wild animals.

The disease known as Malignant Jaundice or Biliary Fever of dogs is also due to a small intra-corpuseular animal parasite, and is transmitted by the dog tick (*Hæmaphysalis leachi*), which again is an interrupted feeder. If, however, the adult female feeds on an infected dog, the parasite passes through the egg, but, although the larva and nymph do not transmit it, it is carried through them to the succeeding adult.

The knowledge of the life cycle and habits of ticks, and of the manner in which they transmit disease, has only been obtained by careful experiment. The details given are somewhat difficult to follow, but may be made more easily understood by reference to the accompanying diagram. It is desirable that they should be mastered by every farmer, because they are of the greatest practical importance.

We have seen that the blue tick, which transmits redwater of cattle, is present on the same host for as long as three weeks, and can therefore be caught and destroyed by a system of fortnightly dippings. But as the brown tick seeks different hosts in the larval, nymphal and adult stages, and may escape from either in as short a time as three days, fortnightly dipping would not avail against it. To eradicate East Coast Fever, therefore, a system of short interval dipping as devised by Watkins-Pitchford must be employed, whereby the animal is dipped at intervals of three or five days.

In order that this might be carried out, it became necessary to discover an agent which, while destructive to ticks, was as harmless as possible to their hosts. After numerous experiments, the so-called “Laboratory Dip” was evolved, which was capable of continued application at intervals of five days for an indefinite period. This preparation, which was also known as the “five day dip,” was made up of—



5½ lbs. soft soap,  
2 gallons paraffin,  
8½ lbs. arsenite of soda (80 per cent. arsenic),  
400 gallons of water.

But when it was found that certain ticks could attach and escape within as short a period as 72 hours, the composition was modified to form what was known as the "three day dip," viz.—

3 lbs. soft soap,  
1 gallon paraffin,  
4 lbs. arsenite of soda (80 per cent. arsenic),  
400 gallons of water.

In addition to the actual in-contact effect upon the ticks, this solution protected the animal for a certain short period by reason of its repulsive effect, and also by reason of the fact that a certain quantity of arsenic was absorbed through the skin and permeated its lower layers and became stored there, so that it is probable that the tick also becomes poisoned by the ingestion of arsenic. The fact that arsenic is freely absorbed is indicated by its presence in the urine of animals regularly dipped.

Since Watkins-Pitchford's discovery, several proprietary dips of a similar composition, and based upon the same principles, have been put on the market, and the one chiefly used in this country is that prepared by Messrs. Wm. Cooper and Nephews, known as "Cooper's Improved Dip," which, by arrangement with the Government, is sold at a specially low price.

A system such as this, which involves no little trouble and labour, is slow to find favour, and excuses are easily found for evading it. The first of these, of course, is the inconvenience caused and the time taken in dipping cattle every three or five days. As we have seen, short interval dipping is absolutely necessary for the eradication of East Coast Fever, and should be practised on farms menaced by this disease, but in other circumstances it has been generally found more convenient to dip once a week, a certain day being recognised as "dipping day," the natives and cattle becoming used to it as a regular part of the farm routine.

Some persons object to the danger of poisoning and scalding. The former will be dealt with later. The latter is avoided by gradually habituating an animal to increasing strengths of dip. Better bred calves especially suffer in this respect if dipped at once in dips of "fortnightly" strength, less so if the three or five day strengths are used, but a small bath of a weak solution can be set aside in which to dip them until their skin becomes resistant, as it will do in time. Animals which have been hastily driven or hustled and are passed through the dip when heated are more liable to scald than those brought up quietly and allowed to go through in a leisurely fashion.

By some it is claimed to be harmful to dip stock all through the year, and distressing pictures are drawn of the suffering of the poor animals during the cold days of winter; but those who for several years have carried on dipping continuously know that these disadvantages are over-rated, and that, like human beings who become accustomed to a cold bath, animals suffer no ill effects from the cold plunge. At the same time some discretion must be exercised, and it is best to arrange the dipping at an hour when the animals will dry as quickly as possible.

It is also said to be harmful to work trek oxen on the day of dipping, but as far as Rhodesia is concerned this objection does not hold good. It will be remembered that in 1906-07 transport oxen arriving in Salisbury were not allowed to leave the commonage unless previously dipped, and it frequently happened that spans were taken to the public tank, dipped in a solution of approximately "fortnightly" strength, were inspanned almost at once, and finished their journey the same day. Some 3,000 head were dipped every month, but no ill effect was ever reported.

It is a habit of the brown tick and the red-legged tick to make its way into the ears and attach to the eyelids, where it may remain protected from the dip, as animals which are accustomed to being dipped learn to avoid the complete immersion of the head. Ticks under the root of the tail often escape owing to some animals keeping the tail compressed when being dipped; others in the tuft of the tail are also protected by the matting of the hair. Therefore, if the best

results are desired in combatting East Coast Fever *these parts should receive special dressing* in addition to the dipping, for it is most important that no infected tick shall escape.

Both the blue and brown tick will attach to equines, sheep, goats and other animals, but in so doing to a great extent lose their infectivity to cattle. Nevertheless, a farm on which ticks are few is better insured against disease than when they are plentiful, *and any system of dipping should, as far as possible, include all classes of stock on the farm.*

Again, it must be borne in mind that in various stages the ticks can remain for long periods on the ground without feeding, and any system of dipping must be carried out regularly, and for a considerable period, to ensure that the crops of ticks are caught as they attach. The principle often enforced by the Veterinary Department in dealing with East Coast Fever, of keeping an infected farm free from cattle for as long as fifteen months after the last case of the disease, is based upon the fact that the brown tick may survive for over a year without feeding. *A dipping campaign must, therefore, extend over a lengthy period.*

By systematic dipping cattle and other animals act as tick traps, collecting the ticks and conveying them to the dip to be destroyed; and if the process is conscientiously carried out the desired results are often achieved even more quickly than might be expected. In one of Watkins-Pitchford's experiments it was found that a badly infected area was cleansed of brown ticks in as short a period as three months.

Certain periods of the year are more favourable for ticks than others. It is well known that in the warm wet season they are more plentiful and active than in the dry winter months. With the onset of the summer rains the seed ticks emerge from the eggs and eagerly seek a host for the purpose of feeding, and it is *at that time dipping should be most vigorously applied*, for it must be remembered that any one female tick which arrives at the adult stage may deposit several thousand eggs which will rapidly hatch during the favourable conditions of warmth and moisture prevailing at that time of the year.

A common method in estimating the degree of tick infestation on a farm is to judge by the number of engorged



females, neglecting the possible presence of the *small larvæ and nymphs which do not attract attention*. It is always wise, therefore, to select certain animals known to be especially susceptible to ticks and search in the ears and under the hairs of the tuft of the tail before coming to the conclusion that the systematic dipping has succeeded in removing all the ticks from the property.

The value of veld fires in the eradication of ticks has been somewhat exaggerated, for at the time of the year when the grass is dry enough to burn, the weather is unfavourable to ticks, which are generally in the egg stage and safely stored away pending the arrival of more congenial conditions.

Old dusty kraals offer very favourable conditions for the rearing of ticks, both as regards warmth, moisture and a supply of suitable food. More than one outbreak of East Coast Fever, which has persisted in spite of the usual method of dealing with the disease, has been traced to *infection originating from the kraal*, and has only been eradicated after vacating the kraal and burning or otherwise treating the manure in it.

Having advocated systematic dipping as a part of the routine of the farm, and having pointed out some of the difficulties associated with it, let us now discuss the advantages likely to arise from it.

The process in the first place was adopted with a view to the eradication of East Coast Fever, and the experiments of Watkins-Pitchford have conclusively proved that this can be achieved by the continued and conscientious application of the three-day system in a comparatively short time. But not only should it be resorted to when the disease has actually obtained a footing, but should be applied as an insurance against it, for no stockman whose animals are heavily infested with ticks can view the future with any degree of confidence. The economic losses occasioned by East Coast Fever, the mortality of cattle, the interference with the ordinary operations of the farm, the disorganisation of transport throughout the district, are so well known in this country that no system which offers so great a promise of success can be neglected.

Redwater and gall-sickness (which is caused by an allied blood parasite) are transmitted by the blue tick, which we have shewn is much more easily destroyed than the brown tick, by reason of the fact that it is a continuous feeder, and may remain on one host as long as three weeks. The indigenous cattle of the country become infected with these two blood parasites early in life by being bitten by infected blue ticks, and as they carry in their blood throughout life these parasites, although tolerant to them, adult ticks feeding on their blood can pick them up and transmit them through their eggs to their larvæ, which thus become infective.

Now, although native cattle do not appear to suffer any ill-effects from the presence of these parasites, careful observation has shewn that they are subject to frequent attacks of low fever associated with a reduction in the number of red cells and anæmia. The young animals, therefore, are deprived of the excess of blood necessary for growth and health, become stunted and are slow to mature.

Animals of improved breeding, however, do not inherit the same powers of resistance possessed by native stock, and suffer more acutely from the effects of these parasites. A considerable number die, if not from redwater or gall-sickness, from other diseases which in a better state of health they would resist—as for example pneumonia, “liver disease” and scour.

When improved stock become infected they suffer even more acutely, and in ordinary circumstances the great majority succumb; thus the improvement of our local stock by grading up becomes a matter of considerable difficulty.

In a recent article the losses from plasmoses have been summarised as follows:—

- (1) Deaths of imported stock.
- (2) Shortage of bulls.
- (3) Impaired usefulness of stud bulls, arising from which (a) loss of service to cows, (b) unsatisfactory calves from the first year's service.
- (4) Heavy mortality of improved young stock.
- (5) Loss of growth and delayed maturity of all classes of cattle.

It is obvious, therefore, that if these losses can be prevented, as they can to a considerable extent by regular dipping, the trouble and labour involved will be quickly repaid.

Recent experiments have shewn that dipping at comparatively long intervals—a week or a fortnight—has apparently removed redwater, but has not eliminated anaplasmosis. The reason for this is not exactly understood, but it is probable that the latter is transmitted by some other species of tick which is not so easily destroyed, and which may find alternative hosts in animals not submitted to dipping. Theiler, indeed, has shewn that, in addition to the blue tick, the black-pitted tick is capable of transmitting anaplasms, but this is not a very common species in this country.

An objection frequently raised is that by “dipping out” redwater from a farm the cattle bred on that property are liable to contract it when exposed on tick-infested veld, and so long as dipping is practised as an exception, and not as a rule, this objection must hold good. Those who under existing conditions are afraid of entirely cleaning their farms can reserve a small fenced paddock where a few native cattle may remain undipped. These will support a limited number of ticks and provide a reasonably mild strain of virus. At suitable times in the year young stock may be turned into this paddock for a few days to become infected, but should be carefully dipped on leaving. The discussions throughout the country which preceded the recent introduction of the Dipping Ordinance shewed the value of dipping was generally recognised, and undoubtedly the areas where the Ordinance is enforced will gradually increase in number and expand, so that the less progressive section of the farming community will be compelled to dip or find themselves quarantined by the action of their neighbours. Thus the areas will link up and dipping will become universal throughout the Territory.

But, apart from the actual transmission of specific diseases, ticks are responsible for considerable losses simply by reason of their presence on cattle. Being blood-sucking parasites, they abstract a considerable quantity of blood which the host can ill afford to lose. It is impossible to fatten cattle



and at the same time feed the ticks on them. They also set up considerable irritation, and often cause abscesses. It is a common thing to find the teats of cows so severely injured that the flow of milk is prevented, and the quarter becomes functionless. The milk supply of tick-infested cows is decreased, the calves are underfed, and the profits of the dairy are reduced.

The biliary fever of equines is comparable in its effects to the redwater of cattle. The acute form is seldom seen except in animals newly imported from tick-free countries, but sub-acute attacks are to a great extent responsible for the poor condition of horses, mules and donkeys so common in this country. In animals suffering from horse-sickness, the tolerance to the biliary fever parasite is broken down so that a chance of recovery is often lost by the concurrence of the two diseases.

We have already mentioned the absorption and storage of arsenic by the skin, and this is more marked in horses than cattle. Horse-sickness being attributed to the bite of a nocturnal insect, the idea of dipping horses as a preventive naturally presented itself, and has been widely adopted with very favourable results.

Another disease amenable to "systematic dipping" is *sheep scab*, which is dealt with elsewhere in this *Journal*.

But, apart from the question of scab, it has been the experience of several sheep owners in this country that systematic dipping has a very beneficial effect on sheep, and this can be readily understood, seeing that they are subject to diseases akin to redwater and gall-sickness of cattle. So that from the double standpoint regular dipping is to be recommended. It may be urged that it damages the fleece, but at present we have few woolled sheep in the country, and it must be remembered that it requires a healthy sheep to grow healthy wool, and an effort should be made at once to put the sheep-raising industry on a sound basis.

It is unfortunate that the most efficient agent known for tick destruction is such a highly poisonous substance as arsenic. Familiarity breeds contempt, and it may be that the frequent

and general use of this poison has led to a considerable degree of laxity and carelessness in handling it.

In the May issue of the *Agricultural Journal* of the Union of South Africa a very important and interesting article by Mr. Jas. L. Webb, F.R.C.V.S., appears, entitled "Arsenical Poisoning of Stock," which gives most valuable and practical information on the subject. One of the most common accidents which lead to fatal poisoning of cattle is dipping cattle in solutions made too strong. This is a common error in this country, either by reason of faulty mixing in the first place or from evaporation and consequent increased strength of the solution in arsenic. This especially occurs in the dry season, but in the wet season the tank often becomes flooded, and sometimes more dip is added haphazard to bring the solution up to strength.

A simple means of avoiding these accidents is to have the tank properly standardised or marked. At the side of the tank should stand a 400 gallon tank of standard solution. After dipping the cattle the level of the dip is noted, and sufficient of the standard solution is added to bring it up to the normal level. If this is done, it is at once known when next dipping whether evaporation or flooding has taken place in the interval. If the former, water is added up to the normal mark; if the latter, sufficient concentrated dip is added to the excess of water to convert it to solution of required strength.

We have previously referred to the scalding of stock unaccustomed to dipping. This is prevented by submitting them to a dip gradually increasing in strength and at gradually decreasing intervals.

Perhaps the most common cause of poisoning is the leaving of dipping solutions exposed to access of stock. The frequency with which this happens is truly remarkable. Either the opened drum of dip is left where stock can actually lick it, or where rains can flood it so that animals can lick the soil or drink the water contaminated by the overflow. In many cases it has been found that cattle have actually drunk at the dip or at the draining pen, or, in the wet season, at the overflow around the tank. This can always be avoided by the

exercise of a little caution, and by giving animals the opportunity of drinking before submitting them to the dipping.

The best antidote to arsenic, whether absorbed or swallowed, is prepared by diluting three ounces of solution of tincture of perchloride of iron with four ounces of water; and by dissolving one ounce of washing soda (carbonate of soda) in half a pint of water; mixing the two solutions. Three doses should be given at intervals of a quarter of an hour. A stock of these solutions should be obtained from the chemist's, and should be available in case of accidents.

In addition, demulcent drinks should be given, such as oatmeal gruel or a large quantity of linseed gruel.

Animals that are scalded may be dressed with carron oil, which consists of lime-water mixed with a quantity of linseed oil, or with an ointment made up of oxide of zinc with vaseline or lard.



## Parasites of Sheep in Northern Rhodesia.

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By FRANK CHAMBERS, M.R.C.V.S., Livingstone.

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In semi-tropical countries like Northern Rhodesia, where the seasons are so clearly defined, one would think that the long dry winter would cause the death of all ova or embryos of parasites. Such is not the case, for parasites in sheep and goats are extremely prevalent. In fact if a flock is not attended to and regularly dosed it will steadily decrease in number. The year's crop of lambs does not compensate for the deaths that occur. In practically every sheep that is slaughtered for meat one finds the *Strongylus Contortus* in the fourth stomach, but unless they are present in large numbers, they do not seem to cause much inconvenience to the animal.

The following parasites have been identified at the Laboratory:—

*Strongylus Contortus*.—This is the fourth stomach worm commonly found in South Africa. Its name is justified by the arrangement of the ovarian tubes which are rolled round the intestine to form regular loops. The white colour contrasts with the dark tint of the digestive tube.

*Strongylus Filicollis*.—A white filiform worm. Male measures 8 to 15 mms., female 16 to 24 mms. with anterior proboscis very thin. It is found in the small intestine, but is not very common.

*Tania Alba*.—The common tape worm that occasionally causes losses. It is not very prevalent.

*Stilesia Centripunctata*.—This tape worm is nearly always found in a flock that is doing badly. According to Revolver

it confines its attentions to the small intestines; holding on to the mucous membrane by a peculiar double sucker on the cephalic extremity. In this country the worm is found in the small intestine and also in the bile canals of the liver. I have not seen it in the gall bladder. In all probability the embryos make their way up the bile ducts and finally settle in the liver. This parasite is responsible for the enormous mortality which commences amongst the flocks after the first heavy rains. The danger attached to the presence of this parasite in the liver lies in the fact that it is practically impossible to reach the parasite with any known vermifuge. The only chance we have to destroy the parasite is when it is lying in the intestine before the invasion of the liver takes place.

The worm is recognised by its possessing only one genital pore in each segment, possesses no neck, segments always broader than long, and it is opaque in the middle line.

The symptoms caused by the presence of this parasite resemble in the main those caused by the presence of large numbers of wire worm. Emaciation is pronounced, the wool comes out in patches and a swelling under the lower jaw is noticed (bottle jaw). Diarrhœa is not a constant symptom unless wire worm be present in large quantities. On opening up a sheep that has died from this disease a large amount of dropsical fluid will be seen to escape from the abdominal cavity. The flesh is anæmic. The liver is very cirrhotic and the bile canals stand out clearly. When one of these ducts is opened a mass of tape worm protrudes, and by careful pulling the entire worm can be removed. In practically every duct that is opened one will find a tape worm. A few specimens will be found in the small intestine. It is extraordinary to what an extent an animal's liver can be infected with this parasite without causing death.

Last year I killed a two-year-old ewe that had been used for some experimental work, and found in her the following parasites:—In the rumen the *Amphistoma Conicum*; in the fourth stomach the *Strongylus Contortus*; in the intestine the *Strongylus Filicollis* and the *Stilesia Centripunctata*, and the same parasite in the liver. In the large intestine I found a mature specimen of the *Tænia Alba*, and in the peritoneal cavity eleven large *Cystercerci Tenuicollis*.

In cases of stomach and liver parasites in sheep I find that the undermentioned mixture gives the most satisfactory results. The only drawback is the cost of the ingredients:—

|            |     |     |     |          |
|------------|-----|-----|-----|----------|
| Lysol      | ... | ... | ... | 2 ounces |
| Chloroform | ... | ... | ... | 2 ounces |
| Turpentine | ... | ... | ... | 4 ounces |

This bottle makes forty doses. When you are about to use the drug add two tablespoonfuls of the above mixture to a bottle of milk or water. This makes sufficient mixture to drench five sheep. The flock should be fasted 24 hours before drenching and for a few hours afterwards. In drenching sheep for internal parasites do not raise their fore quarters, but drench in the normal standing position.

The solution of copper sulphate recommended in the treatment of wire worm is an excellent remedy, but I do not think it exerts any effect on the *Stilesia Centripunctata* in the intestines and cannot have any effect on the parasite when in the liver. Arsenic and salt is another excellent remedy for wire worm. It is astonishing how much arsenic a sheep will take if the drug is administered in a dry state. The proportions of the two above remedies and the method of administration are so well known that it would be mere repetition to detail them. I would, however, advise every sheep owner to make a careful examination of the liver of any sheep that dies. If the *S. Centripunctata* be found no time should be lost in dosing the flock with the remedy previously described, for the only real chance that is presented to kill the parasite is when it is in the intestine before immigration to the liver commences. A large number of farmers in this country dose their sheep regularly, and in consequence have a very small death rate. The whole question of successful sheep farming lies in the ability of the farmer to keep his flock free of parasites.



# Scab or Scabies in Sheep and Goats.

By ROWLAND WILLIAMS, M.R.C.V.S.

The term "scabies" is given to a group of diseases affecting man and the domesticated animals. These diseases are produced by two classes of parasites, viz.—

- (1) Sarcoptinæ, parasites which live on the surface of the skin;
- (2) Demodectes, parasites which penetrate into the skin glands and hair follicles.

The disease was known very many years ago, and was confused with constitutional diseases characterised by skin eruptions, said to be due to heated blood, etc., and treated with internal medicines without result. Now, however, the cause of the disease is understood, also the modes of reproduction of the different parasites. It is unnecessary for the farmer to have a detailed description or the many different names given to these parasites.

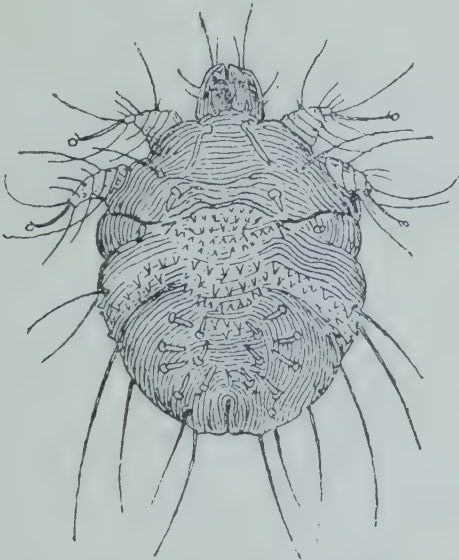
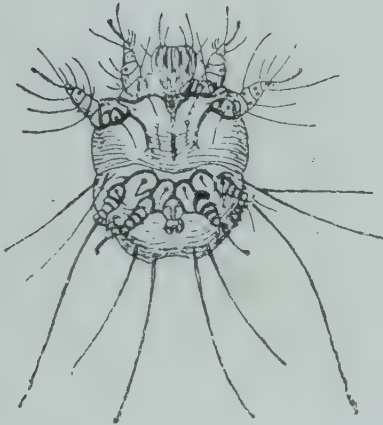
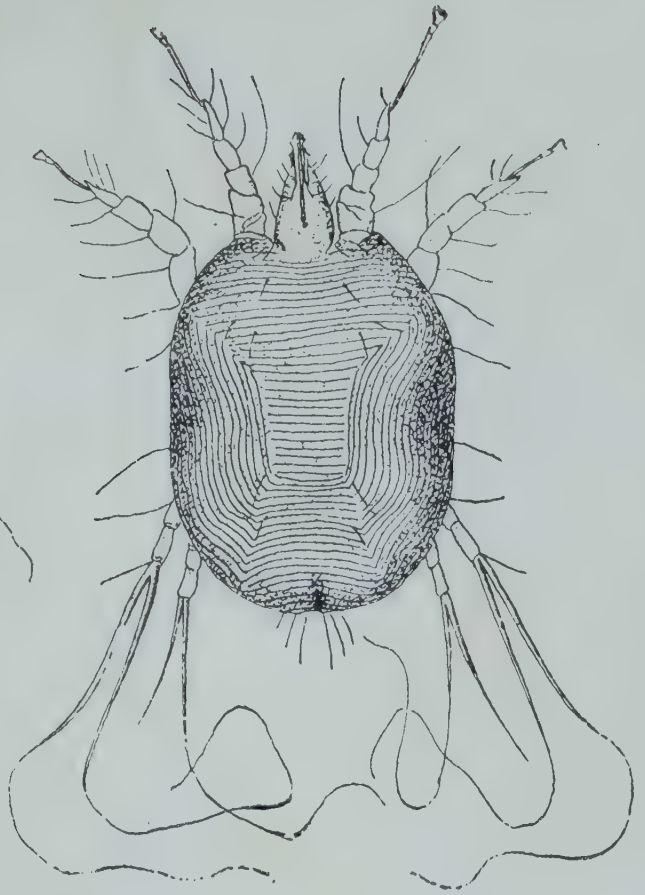
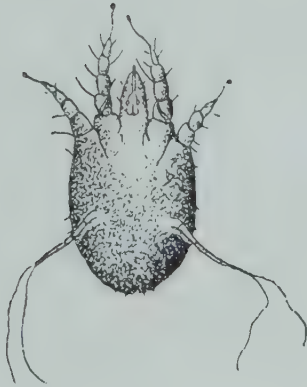
The sheep scab parasites are visible to the naked eye; they are about one-fiftieth of an inch long and about one-eightieth of an inch broad, and can be easily seen if shaken out of a piece of scabbed wool on to a piece of black paper and observed through a pocket lens. They are called *Psoroptes communis*, var. *ovis*. A lengthy description of these parasites is unnecessary; it is enough to say they are much like a crab in appearance. An examination of the accompanying illustration will convey a fair idea of their forms. The disease is transmitted directly from a diseased animal to a healthy one, and by pieces of cast wool lying in the fields and hanging on fences, and by contact with wooden poles, walls and trees after an infected animal has rubbed itself against them. Birds are often seen to perch on the backs of infected sheep, and there is no reason why a bird should not fly away with a piece of infected wool attached to its feet, and then drop it on to a clean flock many miles away.

The parasite responsible for scab affecting woolled sheep is one that lives on the surface of the skin, and it affects only those parts covered with wool. These mites have exceptional vitality in a warm, moist climate, and will live in a sheep kraal separated from their hosts for as long as eight weeks. Speaking broadly, the disease only affects ill nourished, weakly animals, whilst robust sheep in good condition may be cured simply by attention to cleanliness and abundant feeding. In this country the disease is essentially a disease of the dry season, when it makes rapid progress.

In America the disease causes extremely heavy pecuniary losses, and has most seriously interfered with the export of American sheep.

A study of the life history of the scab parasite is necessary in order to determine several different points of practical value, such as the proper time for a second dipping, etc. The female mite lays about twenty eggs on the skin. From these eggs a six-legged larva is hatched (see illustration). The larvæ cast their skin and become mature. These mature mites pair and the females lay their eggs and die. The period required for a generation of mites from the time of pairing to the maturity of the next generation is about a fortnight. Later investigations by Shilston and Bedford give nine days under South African conditions. Gerlach divides the time as follows:—Under ordinary conditions the eggs hatch out in three to four days. Three or four days after birth the six-legged larva moults and the fourth pair of legs appears. This fourth pair is always present when the mites are two-thirds the size of the adults. When seven to eight days old the mites are mature and ready to pair. Three or four days are allowed for pairing. Another generation of eggs may be laid fourteen to fifteen days after the laying of the first generation of eggs. Accepting Gerlach's estimate of fifteen days as an average for each generation of ten females and five males, in three months' time the sixth generation would appear to consist of about 1,000,000 females and 500,000 males. Accepting Shilston and Bedford's estimate, the increase would be considerably greater.

It will be understood that the parasites increase very rapidly, so that, if scab be discovered in a flock, the affected animals should be isolated. If new sheep are brought into the



Left top figure, egg of mite which causes common sheep scab ; middle top figure, six-legged stage of sheep scab mite ; right top figure, young female before moulting for the last time, dorsal view ; middle figure, adult male parasite of sarcoptic scabies of man (the corresponding parasite of sheep is very similar), ventral view,  $\times 250$  (after Blanchard) ; left bottom figure, adult female parasite of sarcoptic scabies, dorsal view,  $\times 250$  (after Blanchard) ; right bottom figure, same, ventral view (after Blanchard). All greatly enlarged. (From Moussu and Dollar.)







A more advanced case of common scab (from Moussu and Dollar).







flock, they should be first dipped as a precautionary measure, or should be kept separate for two or three weeks to see if scab develops. As dipping is not certain to kill the eggs, the sheep should be dipped a second time, the time being selected between the moment of the hatching of the eggs and the moment of the next generation of eggs laid. As eggs may hatch between three and seven, and possibly even ten days under unfavourable conditions; and as fourteen to fifteen days are required for the entire cycle, the second dipping should take place after the seventh day, but before the fourteenth day. This would mean that the eleventh day is about the best; whereas Shilston and Bedford's observations would indicate the eighth day, and as these investigations were made under South African conditions, they should be carefully noted.

The symptoms are simple. The parasite attacks only those parts covered with wool. In the early stages attention is drawn to an injured fleece. It appears as if one had used horse clippers and clipped a patch of wool away, leaving it attached and hanging at one border of the wool cut. The fleece will be noticed to be brittle, and can be pulled apart from the skin in patches. These symptoms are first found over the shoulders, and then over the hind quarters.

When an affected sheep is scratched at a diseased part it turns up its upper lip and champs its teeth, shewing much joy in the sensation. If the skin is examined where a patch of wool has been detached, small spots about the size of a match head will be seen. They are yellowish in colour, and are due to the attacks of the parasites. These spots become larger and burst, and their discharge forms a crust, under which numerous parasites are found. A microscopical examination will clear up any doubt as to whether the disease exists or not. A few of the above mentioned crusts should be scraped from the skin with a penknife without causing bleeding, and a portion of wool with a scab attached should be sent to the Government Veterinary Bacteriologist, Salisbury, for examination. These specimens should be placed in a wide-mouthed pill bottle or tight box, and carefully sealed and labelled with full particulars.

Infected animals should have their food improved in both quality and quantity, because it must be remembered that the disease is one of debilitated sheep. The sheep should be shorn

and dipped in a soap solution; this softens and removes to some extent the scab. Twenty-four hours after, dip again in whatever mixture is chosen; Cooper's sheep dip is recommended. The dips most popular in France are as follows:— Arsenious acid,  $1\frac{1}{2}$  parts; sulphate of iron, 10 parts; water, 100 parts. This is for 100 sheep. The above materials should be boiled for ten minutes. Ewes and sucking lambs should be kept apart for at least six hours after dipping. A scrubbing brush should be used to remove any remaining scabs.

One of the most popular and no doubt one of the best dips is a lime and sulphur dip. I take the following directions for the preparation of this dip from the *Union Agricultural Journal*, written by Mr. Enslin, Chief Division of Sheep:— Take 25 lbs. of well sifted flowers of sulphur and 20 lbs. of slaked lime or 5 lbs. of unslaked lime (the latter being preferable); add 3 or 4 gallons of water to the lime and mix thoroughly with the sulphur into a paste. Throw the mixture into a pot containing 25 to 30 gallons of boiling water, and allow this to remain boiling for 30 or 40 minutes until a dark purple scum rises to the surface. The liquid (with the sediment) should then be placed in a tub with a bung-hole 4 inches from the bottom, and after the sediment has all settled the pure fluid may be run off into the dipping tank and the refuse thrown away. To every 25 or 30 gallons of dip prepared in the above manner should be added 70 or 75 gallons of clean water to bring the mixture up to 100 gallons in respect of every 25 lbs. of sulphur and 15 or 20 lbs. of lime used. It is desirable that the temperature of the liquid in the dipping tank should be maintained at a lukewarm heat throughout the operation of dipping, and in order to do this it is advisable that an additional pot or vessel be kept for hot water. In order to obtain good results when using this dip, it is essential that the lime should be of good quality and be freshly and thoroughly burned, and slaked only when it is required for dipping purposes. In this state the lime consists of almost pure calcic oxide, but on exposure to the air at any time this calcic oxide (essential for the thorough dissolving of the sulphur) becomes changed into calcic carbonate, which latter does not combine with the sulphur to form the soluble sulphides required.

Tobacco and sulphur dip is recommended as a suitable dip



for the treatment of scab in this country. The proportions of this dip are as follows:—Tobacco leaves, 1 lb.; flowers of sulphur, 1 lb.; water, 5 gallons. Place 1 lb. of dark coloured tobacco leaves for every 6 gallons of dip desired in a covered pot of warm water and stand for 24 hours. On the evening before dipping, heat the liquid up nearly to boiling point just for a second, then remove the fire and allow the mixture to stand over night. Now mix the sulphur with water (1 lb. to every 6 gallons of dip required) to the consistency of gruel. Before dipping strain the tobacco mixture, mix well together the sulphur gruel and the tobacco liquid, adding the required water.

To prevent scab, it is essential to keep sheep in good condition, free from worms, and constantly dipped. Sheep should not be allowed to graze in the vleis, but should be paddocked on sloping high land, where there is no sour grass or stagnant water. The water supply should be from a borehole or well. A trough containing a salt lick should be present, and it should contain salt, sulphur, lime, Kerol and bone meal. A sheep dipping tank should be erected, and Cooper's or other sheep dip constantly used. A cattle dip should not be used for woolled sheep. Dipping tanks for sheep can be obtained in Salisbury for about £7.

Scab in non-woolled sheep and goats in this country is generally caused by those parasites which burrow under the skin (but sometimes by the parasite just described). The first symptom is intense itching. It first attacks the trunk, belly, udder and limbs. If neglected it becomes generalised very rapidly, and the animal wastes and mortality is very great. Little pustules are found discharging a viscous liquid which forms crusts. The animals rub themselves raw, and the parts become dry and bran-like scales appear. After a time the hair falls out and the patch becomes larger and wrinkled. For diagnosis purposes scrape away some of the scales and the top surface of the skin, and pack as one would in a case of scab in woolled sheep. It is as well to pack also some scabby hair. Try to obtain some discharge from a pustule, and take a smear of this, as one would take a blood smear. The mortality in a neglected flock in this country is something like 60 per cent. There seems little doubt that Kaffir dogs carry the disease from place to place.



The treatment and cure of scab in non-woolled sheep is very simple, especially to farmers possessing a cattle dipping tank. Cooper's cattle dipping fluid and the laboratory dip are efficient remedies for the disease. All that has to be done is simply to put the sheep through the ordinary cattle dip every week until the desired effect is obtained. Cases can be quoted in this country where farmers have dipped their sheep in this way for a few months and used their old kraals, till eventually they have not only had a clean flock, but also a clean farm. The idea has been to use the sheep to collect the scab parasites in a similar manner to which cattle collect ticks.

Scab has nearly become a thing of the past in the neighbourhood of cattle dipping tanks, where scab used to be an annual occurrence, making the farmers disgusted with their scabby-looking flocks. At these places now are to be seen fine clean thriving flocks of sheep; and as there are upwards of 400 cattle dipping tanks erected in Southern Rhodesia, and the number is being added to continually, quite a big area of the Territory is gradually becoming free of scab.

The foregoing method, although efficient, is a somewhat rough and ready way of treating scab, and if a farmer is breeding woolled sheep, or even if he has a big number of non-woolled sheep, it would be advisable for him to erect a proper sheep dipping tank, and in the case of woolled sheep be careful to use a dip that will not injure the fleece.

It often happens that a quick diagnosis is not made, and the disease is advanced before treatment has been started. In these cases ordinary dipping methods are not to be recommended. The sheep and goats affected should be clipped, washed with soap and water and then rubbed all over with the following:—Ox fat, 1 part; sulphur, 1 part; paraffin oil, 1 part. Heat the ox fat until it is liquid, then pour in the paraffin oil, and, while still stirring, add the sulphur. Keep the mixture warm and stir until a perfect mixture is obtained. Great care should be taken lest it should come in contact with flame and ignite. This is a lengthy method, but it has been found the only satisfactory one in advanced cases in this country. Kraals should be disinfected and white-washed, and all straw, etc., and sacking burned.

# Possibilities of Ranching in Rhodesia.

FROM AN ARGENTINE POINT OF VIEW.

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By ROYLE GRIFFIN, Shangani.

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There has lately been a number of articles in the Press dealing with ranching in Rhodesia. Having many years' experience of ranching in the Argentine, I have been asked to give my impressions as to the possibilities of ranching in this country.

The general impression amongst men I have met in the country is that it is impossible to compare a magnificent cattle country like the Argentine with Rhodesia. Now I do not wish to do this, but I should like to point out that a great part of the best land in that country, which carried stock on dry land lucerne all the year round, has risen in the last few years to such a price that it does not pay to ranch stock on it; further, that these same lands are little by little being split up into smaller blocks and placed under agriculture. The ranching lands of to-day and to-morrow are in the Northern Argentine, in Paraguay and Central South America. I have been through a great part of this country reporting on its ranching capabilities, and most of that country, in my opinion, is not superior to Rhodesia. The stock suffer from red water and a number of other diseases there, and in some parts of the country it is impossible to keep a horse.

I consider there is no country in the world to-day that offers such good prospects for the ranching companies who are prepared to develop the land as Rhodesia. For the small man who can take up 3,000 to 10,000 acres in this country, his capital should be invested in stock and windmills: fencing can always be erected later.

I am unable yet to come to any conclusion as to the best beef breed for Rhodesia. In the Argentine we have the Shorthorns and the Herefords in the front rank; my experience has always been that a Hereford will thrive where a Shorthorn will not. Most of us have our favourite breed. The Devons appear to do very well for crossing purposes, but I should like to see the Herefords given a fair trial, and I certainly think for ranching they are much more suited than the Shorthorn for crossing with native stock. I think the first step in Rhodesia for the foundation for ranching purposes would be the Africander for the large breed and the Angoni or Mashona for the small breed. I should cross the native stock with carefully selected Africander bulls, and get size and hardiness into my herd; later I should cross with the progeny of imported pure-bred stock. But these, too, should be very carefully selected, and the fallacy not accepted that because an animal has a pedigree it is good enough to cross with. Never use cross-bred or "grade" sires in grading up cattle; the result will only be a leggy, bad coloured brute.

It is impossible to lay down rules for the care of stock, as it takes years of experience to make a good stockman. I should like, however, to recommend a few suggestions for those who have not had a great deal of experience. Remember in the care of stock it is necessary to keep as near nature as possible. Do not put useless native boys on herding stock; employ the best boy you have on the farm. Teach him his duties, and do not let him keep the cattle in a bunch as one so often sees in this country. Do not kraal at night if you can possibly help it. I am afraid that on a great many farms cattle are driven miles to water and good grazing, only to be brought back over the same long tramp at night to be shut up until the following morning. Remember cattle do not stray naturally, but only in search of food. Let your calves run with their mothers. Take care that your stock are not roughly handled; remember that beef cattle never want to lose an ounce of flesh from the day they are born.

Water is a very important question all over Africa, where stock suffer a great deal through want of it. If you have not a running stream all the year round on your farm, erect windmills wherever possible. They will soon repay the outlay.



If you water your stock from dams or pools, fence them off, and erect a pump and troughs so that your stock have always clean water to drink. Remember that stock should never have far to go for water; it is wonderful how stock will pull through a bad winter if they have a plentiful supply of water.

Always keep a plentiful supply of rock salt in front of your stock; they will help themselves when they want it. I should recommend keeping a few lumps of rock salt in a box near the watering places.

It has been found a good practice in the Argentine to castrate calves when about ten days old, as at such an age they do not lose condition or suffer. At the same time we used to dehorn all our beef steers, and this is easily done by the use of a bar of caustic. We found the animals fattened better, and did not knock each other about when training or shipping, and the buyers from the freezing companies always prefer dehorned stock.

I am a believer in weekly or ten-day dipping, and should like to see it made compulsory in Rhodesia.

Arrange seasons to put your bulls to cows so as they all calve down about the same time. The best practice during the service season is to let your bulls go in the cool of the evening and stable them during the day time, taking care to keep them in good condition.

The chief drawback to-day seems to me the lack of markets for our stock. I think we all ought to look to an export trade, and not to the markets of the south, which are so far away and so uncertain. What I should like to see in Rhodesia would be a cannery erected at Beira or some suitable place, to take the growing supply until such a time as we have sufficient cattle to warrant a chilled meat factory being started. In regard to the cannery, I do not see why it should not be run as a sound business proposition, considering the large quantity of canned meat that is imported into the country. I have no doubt that by the time the cannery was started there would be an ample supply of cattle. I consider that the cannery should be erected in a suitable place for export, so that when we have the number of cattle to start the chilled meat export

trade it might be possible for the same company to erect the freezing plant, the better class of stock to be chilled and the inferior canned.

My opinion is that we should not export to the Smithfield market, as we should be competing against the best stock in the world, but rather we should look for a continental market, where we should not have the same competition, and be able to secure a good price for our stock until such time as we might have the quality that is required on the Home market.

In a country like Rhodesia, subject to a long, dry winter, the use of succulent winter feed for stock is very necessary to keep the animals in condition and maintaining growth, especially beef steers. Maize silage is one of the cheapest and most valuable forms of stock food. Every farmer and rancher should always have a good supply in hand in case of a drought or a bad season. Also remember that once the beef trade is established the most profitable method of disposing of your grain will be to send it to the market on four legs.

There are many important subjects I have not discussed, but I am certain that with the many keen ranchers and farmers we have in Rhodesia the day will come soon when we shall see this country take a big move forward and stand amongst the beef exporting countries of the world. I consider Rhodesia an ideal country to settle in, and that for all men who will work there is as good an opening here as in any country in the world. Although I myself come from the finest cattle country in the world, I am quite content with Rhodesia, and think that we are to-day undergoing many of the same difficulties as we experienced in the Argentine in the early days.

# The Principle of the Winter Feeding of Dairy Cattle.

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By R. C. SIMMONS.

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Some ten years ago a census was taken in the State of Minnesota of the ordinary dairy cows of the State. Presumably this census was of such cows as those who are dairying in this country usually possess at present. At the same time a comparison was made between the yields of those cows belonging to men who studied dairy literature and of cows belonging to those who did not. It was found that the cows belonging to the former class yielded twice as much as those belonging to the latter.

It would appear, therefore, that while it is most desirable that we should relax no efforts to grade up our dairy herds by the use of good bulls and so on, we may very profitably reap a considerable immediate increase in profit by paying more attention to such cows as we have.

The average Rhodesian farmer is fortunately an intelligent, educated man capable of understanding ordinary scientific reasonings. It is most desirable that we should cultivate the habit of considering the question of feeding cattle from a scientific standpoint, so that we may apply the knowledge thus gained in conjunction with the knowledge we have acquired and may acquire by daily observation and the exercise of common sense.

Science without practice may often be misleading, but science with practice is of the greatest value. The one helps to check the other. The business of feeding becomes infinitely more interesting, and one's thoughts and experiments in connection with the subject are unconsciously guided along sounder and better lines.

One cannot do more, in the course of a short article such as the present, than point out how elementary science may be applied to the dairy business of feeding cattle, and try and



make it clear that the subject is one which may be followed up with interest and advantage in one's own home.

In order to properly understand the literature on the subject, it is necessary and convenient to make one's self acquainted with a few simple terms such as are used by most writers, and to accustom one's self to think in those terms.

Cattle feeds may be divided into two classes, namely, roughage, such as hay, silage, maize fodder, roots, etc., and concentrates, such as grain and oil mill products. In both these classes of feed there are three main substances which go towards the building up of the animal body and the production of milk. These we must always consider in making up rations. They are known as protein, carbohydrates and fat. In addition, all feeds contain water in a greater or lesser degree and a proportion of mineral salts.

Proteids is the name for a group of materials containing nitrogen, and is necessary for the formation of lean flesh, blood, tendons, nerves, hair, horns and the casein and albumen of milk.

Carbohydrates is the name for a group of materials which do not contain nitrogen. This group is again sub-divided into two kinds, namely, nitrogen free extracts (such as starch, sugar, gums, etc.), and crude fibre. They are either stored up in the body as fat or are consumed in the body to produce heat and energy.

Fat is soluble in ether, and is therefore sometimes referred to as ether extract. It is also free from nitrogen. It serves the same purpose as carbohydrates, but 1 lb. of fat is worth as much as 2.2 lbs. of carbohydrates. In making calculation we multiply the fat by 2.2 and call the result the carbohydrate equivalent. In the feeding of all animals, what is known as the nutritive ratio must be taken into account. The body of a cow in average condition may be taken as containing roughly 54 per cent. of water, 17 per cent. of protein, 22 per cent. of fat, and  $5\frac{1}{2}$  per cent. of mineral ash. The actual amounts vary according to the condition of the animal. As has been pointed out, these substances are found in varying proportions in farm foods. They are extracted from them by the animal for the repair of its tissues and the production of milk and fat.

A suitable and profitable food is one in which the protein,

or flesh-forming substances, and the carbohydrates, or fat and heat-producing substances, are in such a proportion and such a condition that the animal may assimilate them in accordance with its needs and without waste. The proportion of proteids to carbohydrates and fat is what is known as the nutritive ratio. When we read that the nutritive ratio of any given feed is 1:6, we understand that for one part of digestible flesh-forming substances contained in it there are 6 parts of digestible fat and energy-producing substances. We need not, as a rule, concern ourselves with the proportion of mineral salts, as they are generally present in sufficient quantities.

The nutritive ratio of a ration for a cow in milk should be from 1:5.5 to 1:7.5, but not narrower (as the expression is), that is, the proportion of carbohydrates should not be less than that. Mathematical correctness is not considered necessary, but the ratio indicated will, other things being the same, be the most economical, because it will supply the needs of the cow without waste. In addition to the chemical composition of foods, their cost, suitability, palatability, proportion of moisture and bulk must be taken into account. A cow in milk requires a certain amount of food to maintain her body, and a certain amount over and above that for the production of milk. This latter amount varies with the amount of milk which she is capable of producing. The following standard, known as the Wolff-Lehmann standard, will serve as a good average guide to the amount and quality of food required by a milch cow of 1,000 lbs. live weight: —

| Class of Cow                             | Total Dry Matter | Digestible Nutrients |                |      | Nutri-tive Ratio |
|--|------------------|----------------------|----------------|------|------------------|
|  |                  | Protein              | Carbo-hydrates | Fat  |                  |
|  | lbs.             | lbs.                 | lbs.           | lbs. |                  |
| 1. Cow giving 11 lbs. of milk daily ...  | 25               | 1.6                  | 10             | 3    | 1:6.7            |
| 2. Cow giving 16½ lbs. of milk daily ... | 27               | 2.0                  | 11             | 4    | 1:6              |
| 3. Cow giving 22 lbs. of milk daily ...  | 29               | 2.5                  | 13             | 5    | 1:5.7            |
| 4. Cow giving 27½ lbs. of milk daily ... | 32               | 3.3                  | 13             | 8    | 1:4.5*           |

\* This is a narrower nutritive ratio than most authorities advocate.

As most of our cows are less than 1,000 lbs. live weight, we may perhaps regard 24 lbs. of dry matter as being sufficient in most cases.

Let us suppose that we require to feed a cow giving 12 lbs. or 20 lbs. of milk daily, and we have available on the farm mealies, ensilage, bean meal and linseed, and in addition a green barley crop coming on, and the cows are still getting a fair bite of old but nutritious grass. We will proceed to make up a trial ration as follows:—Mealie meal 4 lbs.—this we know from reference to analytical tables is deficient in protein, so we will add 1 lb. of bean meal, which is richer in protein, to balance it. The veld being dry, we want some succulent bulk, so we take 20 lbs. of ensilage. A cow feeding on good veld and receiving that only will consume over 100 lbs. per day. We are considering early winter, so we will estimate the grass consumed as 75 lbs. per day, and we then proceed, with the help of analytical tables as before, to put down the ration, shewing its chemical contents, and to consider it:—

| Feed                |     | Solid Matter | Digestible Nutrients |                |              |
|---------------------|-----|--------------|----------------------|----------------|--------------|
|                     |     |              | Protein              | Carbo-hydrates | Fat          |
| Mealie meal, 4 lbs. | ... | lbs.<br>3.56 | lbs.<br>.316         | lbs.<br>2.67   | lbs.<br>.172 |
| Bean meal, 1 lb.    | ... | .89          | .202                 | .42            | .013         |
| Ensilage, 20 lbs.   | ... | 5.28         | .250                 | 2.84           | .140         |
| Grass, 75 lbs.      | ... | 15.0         | 1.86                 | 7.5            | .12          |
| Total               | ... | 24.73        | 2.628                | 13.43          | .445         |

The nutritive ratio is obtained by multiplying the fat by 2.2, adding to it the carbohydrates, and dividing the sum by the protein thus:—

$$\begin{aligned}
 & (.445 \text{ by } 2.2) \text{ plus } 13.43 \text{ equals } 14.41 \\
 & 14.41 \text{ divided by } 2.628 \text{ equals } 5.04
 \end{aligned}$$



The ratio, therefore, is 1:5.04, and is a little too narrow, otherwise there is not much at fault with the ration. It is probable that as the winter wore on the grass would be less nutritious, and that the ratio of nitrogenous to non-nitrogenous food would become wider. In order, however, to put it more nearly right at the moment we seek for some means of reducing the proteids. The bean meal has a narrower nutritive ratio, *i.e.*, it contains a higher proportion of nitrogenous substances than the other ingredients, so we will try the ration without it. We must not forget, however, that the amount of solid matter must be made up, so we will add in place of the bean meal 5 lbs. of ensilage, and then calculate as before, in order to see whether or not we have improved matters.

| Feed                    | Solid Matter | Digestible Nutrients |                |              |
|-------------------------|--------------|----------------------|----------------|--------------|
|                         |              | Protein              | Carbo-hydrates | Fat          |
| Mealie meal, 4 lbs. ... | lbs.<br>3.56 | lbs.<br>.316         | lbs.<br>2.67   | lbs.<br>.172 |
| Ensilage, 25 lbs. ...   | 6.60         | .312                 | 3.55           | .175         |
| Grass, 75 lbs. ...      | 15.0         | 1.86                 | 7.5            | .12          |
| Total ...               | 25.16        | 2.488                | 13.72          | .467         |

(.467 by 2.2) plus 13.72 equals 14.74

14.74 divided by 2.48 equals 5.9

The nutritive ratio is therefore 1:5.9, or nearly 1:6. We find we have increased the solid matter by approximately 1 lb., but as the ensilage will probably be cheaper than the bean meal, the ration as a whole is more economical. Towards the end of winter, when the veld grass is not only less in quantity but less nutritious, it will be necessary to find something to make up the proportion of proteids to fat and carbohydrates, and we shall probably find that by substituting forage crops, such as green barley or oats, for some of the ensilage, and making up the bulk with hay, we shall be able to do this.

As before-mentioned, science without practical knowledge is occasionally misleading, and sometimes we come across a feed of which the beneficial action is not entirely explained by its chemical composition and which would appear to be in the nature of a stimulant to the digestion. Cows fed on 8 lbs. or 9 lbs. of mealie meal per diem, hay, and say 2 lbs. of molasses, will thrive and milk quite well, notwithstanding the fact that both mealie meal and molasses are rich in carbohydrates. Such a ration, however, may be harmful if long continued, and one more of the nature of those indicated will be better in the long run, and has the advantage of being home-grown.

In conclusion, one would remind the reader that although the subject has only just been touched on in this article, correspondence with the writer, with a view to studying it further, is cordially invited.

## Oats in Southern Rhodesia.

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By H. GODFREY MUNDY, F.L.S., Government Agriculturist  
and Botanist.

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Year by year increasing knowledge is extending the range of crops which can be grown in Rhodesia, and thereby facilitating the production of suitable stock feeds and the problem of crop rotation. Oat hay is one of the most valuable fodders which the South African stockman can wish for, and during the past five years numerous experiments have been carried out on the Government experiment farms with the object of securing varieties of oats better suited to local conditions than those commonly grown.

Oats as a winter crop have been popular for some years both on irrigated land and on naturally moist land without irrigation, but as production has increased, prices have fallen, and it is now open to doubt whether irrigated land cannot as a rule be put to more profitable use than in the growing of oat hay. What such uses may be are beyond the scope of the present article, but mention may be made of wheat, lucerne and citrus fruits, according to the character of the land available. In the writer's opinion, oat hay for home feeding must in the near future take its place either as a winter catch crop on moisture-retaining soils or as a summer crop, and the object of the present article is to summarise the information gained on this subject by means of the experiments above referred to.

As with wheat, so also oats in this country are extremely subject to rust, and this is at present the only serious danger to which the crop is liable. Again, as with wheat, winter sowings are not usually attacked so severely as summer crops, but nevertheless the most suitable varieties for either summer



or winter cropping are those possessing a certain degree of rust resistance.

**OATS UNDER IRRIGATION.**—The two varieties most commonly grown under irrigation are the Boer oat and the Algerian. The former is a relatively quick-maturing, short, fine-strawed oat, with heavy heads, and producing the better quality forage. Much difficulty, however, is frequently experienced in procuring seed true to name; the variety is not remarkable for its rust resistance, and to give the best results requires a rich fertile soil and ample irrigation. For these reasons the Algerian is now more frequently grown. This is a slower maturing oat, requiring 6 to 7 months from seeding to harvest, thus extending the period over which irrigation is necessary, and frequently bringing the reaping time into the beginning of the rainy season. The latter feature is its main objection, and for some time now farmers have been enquiring for quicker maturing varieties more closely resembling the Boer oat, but with greater powers of rust resistance. It may here be mentioned that with winter sowings the actual date of seeding appears to have little influence on the date of ripening. In other words, the crop remains practically dormant during the cold period from the middle of June to the middle of August, and little difference is usually noticeable whether seeding is done early in April or a month later. The period of rapid growth is from the middle of August onwards, and it is at this time that the early varieties shew to advantage, ripening as they do in the beginning of October, whereas slow varieties may not be ready for the reaper until well into November.

Although frosts are not severe in this country, it is still necessary to regulate the date of sowing in such a way that the crop will not come into flower during the period when frosts may be expected. The usual date of seeding for winter oats is about the third week in April to the first week in May, and from 60 to 80 lbs. of seed is required per acre, the smaller quantity where drilling is practised or with slow varieties, the larger when broadcasting or with quick varieties, since these do not tiller so much, and consequently more plants are required to cover an acre.

**OATS ON MOIST SOILS WITHOUT IRRIGATION.**—This method



Sixty Day Oats, Longila Experiment Farm, Matabeleland. Grown on poor sandy soil with a rainfall of 1.66 inches during period of plant growth. Sown 17th February, reaped 3rd June, 1914.



New Zealand and Smyrna Oats, Gwebi Experiment Farm, 1914. Sown 8th January, reaped 15th April. Yield 2,787 lbs. and 2,369 lbs. per acre respectively.







of growing the crop is of comparatively recent origin, and has only come into vogue with a better knowledge of the potentialities of our vlei soils. Generally speaking, there are three main types of Rhodesian vlei soils; one, the granite vlei of varying depth, composed of more or less fine grained sand in combination with organic matter and a small amount of clay. Some of these soils after a normal rainy season will remain moist the whole winter through; while others will not retain sufficient moisture to support plant growth after August. The second class is the excessively peaty soils found in many of the river valleys, and which are often reclaimed reed beds. These usually contain abundance of moisture for plant growth during the dry season, but are of less frequent occurrence than the two other types. The third is the normal black loam or turf soil, common in the valleys of gold belt farms, and which usually tends to crack and dry out early in August.

Each of these types calls for special treatment in regard to tillage, selection of varieties and date of seeding. Whereas on those of high moisture-retaining ability oats may be grown almost as if under irrigation, on dryer soils earlier sowing must be practised and quick maturing varieties used. Others again can undoubtedly be benefited and rendered more suitable for winter cropping by the adoption of a well planned system of dry farming, having for its object the conservation of as much moisture as possible.

With such wide variations in their character and moisture-retaining powers, it is naturally impossible to dogmatise on the handling of these winter lands. The success of the crop depends primarily upon the supply of water available, and hence, where this is abundant throughout the winter, late varieties can be grown and seeded down at the same date as an irrigated crop. On the other hand, with soils which dry out in August, earlier seeding in March or April and the use of quick-maturing rust-resisting strains may be necessary. Exact information on these points can only be gathered by actual experiments, and, even so, conditions of season will be an influencing factor. With the choice of varieties available, however, it is now possible for the great majority of Rhodesian farmers, even without irrigation, to

have winter crops of oat forage either for feeding green or for conversion into oat hay.

**SUMMER OATS.**—The question of growing oats as a summer crop is upon an entirely different plane, and the governing factor here is rust. Rust is a fungoid disease, the spores of which are wind-carried. The first symptoms of attack are yellowish blotches on the leaves, which, under favourable weather conditions, may rapidly spread to the stems and ears, the whole plant or field finally assuming a yellowish, wilted appearance. Where the attack is becoming severe, the yellow spores or powder will adhere to the hands or clothing, on the plants being touched. A few rust spots on the leaves are not serious, but as soon as this becomes general or appears on the stems, the crop must be carefully watched. If the plants are nearing maturity before the rust reaches the stalks, comparatively little injury will be done, but if it gains a firm hold just after the ears have appeared, it is often better to cut for hay at once. Experience, however, is the only reliable guide, the object being to secure as great a weight of crop with as little injury from rust as possible.

The disease is invariably more prevalent during the summer months in crops grown on low-lying land which as a rule contains an excess of organic matter or humus. With crops grown on well drained soils, containing, as they do, a higher percentage of mineral matter and silica, the straw is harder and the leaf growth less luxuriant, with the result that the plants are less sensitive to attack. The principle may be accepted, therefore, that summer oat crops should always be sown on well drained red or sandy soils, and not on black soil. The exact conditions most conducive to rust are hard to explain, but, given resistant types, it may be said that any factor tending to check or militate against healthy growth, as also excess of moisture or dull weather for long periods, render the plants more liable to attack and less able to resist it. In explanation of this, the results of the last two seasons may be quoted. During the summer of 1913 heavy and continuous rains fell during March and April at the Botanical Experiment Station, and without exception all varieties of summer oats suffered severely from rust, only the quickest maturing strains giving satisfactory returns of oat forage. In 1914



practically no rain fell after the middle of March, and the quick-maturing varieties again gave excellent crops, but the late strains, which only commenced to pipe towards the end of March, without exception suffered so severely from drought and then from rust that they had to be cut before in full head, otherwise the crop would have been ruined.

Rust is generally most prevalent during the latter part of March or beginning of April, while the most critical period of plant growth for the disease to make its appearance is during the piping stage, *i.e.*, when the flower heads are commencing to shoot from the leaf sheaths.

Theoretically, therefore, a grower of summer oats would have three courses open to him—(1) to grow a variety absolutely resistant to rust or rust-proof; (2) to grow one partially resistant to rust and which, owing to quick maturity, will be past the most critical stage by the middle of March or thereabouts; (3) to grow a slow-maturing variety, or to sow late, so that the crop will not pipe until well into April, by which time the worst of the rust attack has usually disappeared.

In practice, however, no variety has yet been found which is entirely resistant to rust, so that this consideration must be discarded. Similarly, the experience of the last five years has shewn that, on the ordinary well drained red or sandy soils, late sowings or the use of slow-maturing varieties seldom result in success, since the land dries out too rapidly, and insufficient moisture is available to mature the crop. Early sowings are impracticable, since, to mature before the severe rust period, the crops would require to ripen during the wettest part of the rainy season, which is obviously undesirable. Success, therefore, seems to lie in the middle course, namely, the choice of quick-maturing types possessing as great powers of rust resistance as possible, and it is only by working along these lines that consistent success with the summer crop has been obtained. It must here be said that, even with the best management, the summer oat crop cannot yet be relied upon with entire certainty, but, on the other hand, if the right varieties are sown at the proper date and rate of seeding, the crop need never be a complete failure,



and should be successful at least two years out of three. In the results referred to above, late varieties, though reaped before they were in full head to avoid loss, gave returns of oat hay of sufficiently good quality for home feeding, though not for sale, and at rates varying from 1 to 2 tons of hay per acre.

A feature of no little practical importance is that where a summer crop is cut before it is in full head, those plants which have not yet headed will make a re-growth, and afford a valuable aftermath for grazing. In the case of plants which have headed no re-growth is made. Thus, if rust appears, and a crop is cut before it is fully grown, not only is good forage obtained for home use, but there is also an excellent aftermath for grazing.

Comparatively little success has yet been attained in growing a summer oat suitable for threshing. A large number of the best kinds of feed oats grown in Europe and America have been tested for several seasons, but the yield of grain has been poor and, since they are usually slow-maturing types and not too resistant to rust, they appear to shew little promise. On the other hand, the quick-maturing strains which have given the best results as regards forage are usually rather poor grain yielders, or, if this is not the case in their country of origin, they have at least proved so in Rhodesia. Further research will, it is hoped, result in the securing of a suitable threshing oat, but for the present the recommendations in this article regarding summer oats must be taken as applying to the production of oat forage or oat hay and not of grain.

Unnecessary space would be occupied in giving a detailed list of the numerous varieties—amounting in all to several hundreds—which have been tested during recent years. The under-mentioned are those which have proved most successful, and which are regarded as best suited to this Territory. A short note on the more important characteristics of each is given, stress being laid upon period of crop growth. In addition to being a guide for summer cropping, this will enable farmers to select strains other than those they now have, for growing during the winter either under irrigation or on moist soils. Naturally, plant growth is not so active during our winter months as in the summer, but varieties quick-maturing under

summer conditions will shew the same characteristic, though to a less extent, when grown as winter crops. The greatest success under summer crop conditions has been secured with the following: Sidonian, Garton's Abundance *ex* New Zealand, Smyrna, Burt, Early Ripe, Sixty Day and Daubenny, also Algerian and Texas, to which special mention will later be made.

*Sidonian Oat*.—A side oat carrying an abundance of leaf growth, but apt to be rather light in the ear. Should reach a height of 3 to 3½ feet at maturity, but the straw towards the base is rather coarse. Requires about 4½ months to mature for forage, and gives a good yield. In 1914, 4,608 lbs. forage per acre were obtained. The Sidonian oat is only moderately rust-resisting, and must occasionally be cut before fully mature to escape rust. Owing to its coarse straw, it is not best adapted for winter sowings except where *green* fodder is required.

*Garton's Abundance* is a full panicle oat, but in other respects is not unlike the Sidonian, with which it ranks equal in respect of rust resistance, length of maturity and quality of forage. It is even more leafy and coarser in the straw, though not necessarily a heavier cropper. In 1914 it yielded 3,000 lbs. forage per acre, but lost weight by being left to stand too long in the hope of giving a seed crop. This variety has consistently done well on the red soil of the Gwebi Experiment Farm.

*Smyrna Oat* has only been under trial for two seasons, but in both cases has done well. In 1914, sown 2nd January, it was cut *for seed* on 5th May (4 months, 3 days), being then fully ripe and standing 2½ to 3 feet high. The yield of grain per acre was 860 lbs., or about 21 bushels. The forage is of good quality, and the grain large and heavy. It is moderately rust-resisting, and is assisted by its quick maturity. It should also be an excellent winter variety, either for grain or forage.

*Burt Oat*.—A variety of great promise. Extremely rust-resisting, and producing a fine straw 2½ to 3 feet in length, with heavy heads and nice quality, moderately large grain. In 1914, sown 5th January, it was cut for seed 30th April (3



months, 25 days). As a forage crop it should be ready for the reaper in  $3\frac{1}{2}$  months from date of seeding.

*Early Ripe*.—This and the two following varieties were introduced some four years ago, and have consistently produced successful summer crops. In 1912, a season remarkable for the severity of the rust attack, these were the only three kinds which matured without serious injury. There is little difference between them as regards rust-resistance or quality of forage, which is of the finest. They also yield fair returns of grain, though the individual kernels are small and rather light. The straw averages 3 to  $3\frac{1}{2}$  feet in length, with heavy heads, and the crop requires 12 to 14 weeks to mature. Yield of forage in 1912, 3,300 lbs. per acre.

*Sixty Day or Kherson* is similar in all respects to the above, but it is a trifle shorter in the straw, and if anything a few days earlier. Yield of forage in 1912, 4,400 lbs. per acre; and of grain in 1914, 860 lbs. per acre, or about  $22\frac{1}{2}$  bushels.

*Daubenny* compares in time of maturity with *Early Ripe*, but is generally slightly heavier in the head. Yield of forage in 1912, 4,080 lbs. per acre.

*Algerian and Texas*.—These two varieties appear almost identical, shewing practically no difference in their degree of rust resistance, the quality of grain and forage and length of maturity. As summer crops for red soils they are too slow, requiring 5 to 6 months from date of seeding to date of ripening, and in consequence suffering from lack of moisture in the later stages of growth. They are both good rust resisters, however, and are not infrequently grown successfully on black soils more retentive of moisture, seed being sown in late December, and a crop taken about May or June. As such, however, they hardly fall under the category of summer crops, and would be perhaps more accurately described as winter crops on moisture-retaining soil.

Of the above varieties, *Algerian*, *Texas*, *New Zealand Abundance*, *Sidonian*, *Smyrna* and *Burt* are commercial strains of which the seed can be purchased from South African seed merchants. This, however, is not the case with the others named, seed of which is extremely difficult to procure. In con-



sequence, all the seed now available will be sown on the Experiment Farms during the coming season in order to produce our own grain, which will then be available for distribution.

Since in the growing of summer oats we have a concrete danger to face in the form of rust, the utmost care must be taken to give the crop the best chance possible. To do this, seed must be sown on suitable soil and at the right date. The season of the year when rust is most prevalent and the period of growth when the plant is most receptive to attack have been dealt with, and the writer is confident that if farmers will follow the directions given, the large majority will in future be able to raise successful crops. Unless expressly referred to, no special treatment of any kind is ever given to the crops on the Experiment Farms, while, on the other hand, they are frequently exposed to greater danger of rust infection by being grown in close proximity to highly susceptible varieties. Thus crops which can be grown successfully on the Experiment Farms should be equally within the reach of private farmers, provided they are given similar treatment.

**SEEDING OF SUMMER OATS.**—The land chosen for the crop should always be well drained and not subject to water-logging. Red soils are the most suitable. The seed bed should be worked to a rather finer tilth than for maize, and should be reasonably compacted by discing or harrowing. When broadcasted, ploughing under the grain is not recommended, as the seed is frequently covered too deeply. It is better to broadcast and then harrow heavily. Seeding should not be too heavy, as an excessively thick stand is more liable to rust attack. Drilling is always preferable to broadcasting, but it is by no means essential to success. The most suitable date of seeding for all quick-maturing varieties is from 25th December to 5th January. Earlier or later seedings are risky. The later date should be chosen for varieties requiring only 3 to 3½ months to mature, and the earlier for slower varieties. Sixty to eighty lbs. of seed per acre is ample; the heavier seeding when broadcasting and with very quick-maturing strains. For Sidonian, New Zealand, and Smyrna Oats 60 lbs. of seed per acre, sown broadcast, is sufficient.

**LOOSE SMUT.**—Oat crops, whether summer or winter sown,

are always liable to a disease known as *smut*. There are two forms of this fungoid disease, the spores of which are carried on the seed, and, if not destroyed by some recognised treatment, will grow with and in due course infest the plants. The presence of loose smut, the most common form, is not noticeable until the crop comes into ear, when the heads of infected plants will be seen to have a blackish colour. On closer examination it will be found that this discoloration is due to the ripening glumes or chaff being filled with a black powder, which is the smut spores. With the second form of the disease, the black spores are confined within the grain, and cannot be detected until the kernel is broken after threshing. Smut not only reduces the yield but also seriously impairs the feeding value of the grain or forage, and preventive measures should therefore always be taken against it. The method recommended is as follows:—Take one pint of *formalin* (obtainable from any chemist) and mix with 25 gallons water or in similar proportion. Seed oats in sacks which are not quite full should then be immersed in the liquid for *10 minutes*, after which they are taken out and dried. They should be sown within a few hours. The sacks being not quite full permits the solution to saturate the whole more readily. Twenty-five gallons are sufficient to treat 20 bushels (or about 800 lbs.) of seed.

**OATS IN ROTATION.**—The continuous growing of maize, especially on the red soils of this country, produces a marked effect on the mechanical condition of the soil. Each year, as a rule, it is noticeable that such land ploughs up with larger and harder clods, thereby increasing the difficulty of obtaining a good tilth in time for early planting. This can be accounted for in two ways. Firstly, owing to the consolidating effect of frequent cultivation, and the beating down of the soil by heavy rains. Secondly, owing to the fact that so small a proportion of the stalks and leaves of the maize crop are annually returned to the land, and that, in consequence, there is a constant dissipation of humus or decayed organic matter. The presence of a sufficiency of humus is one of the essentials in a free working soil, and, unless this sufficiency is maintained, it becomes increasingly difficult to work the land properly or to raise profitable crops.

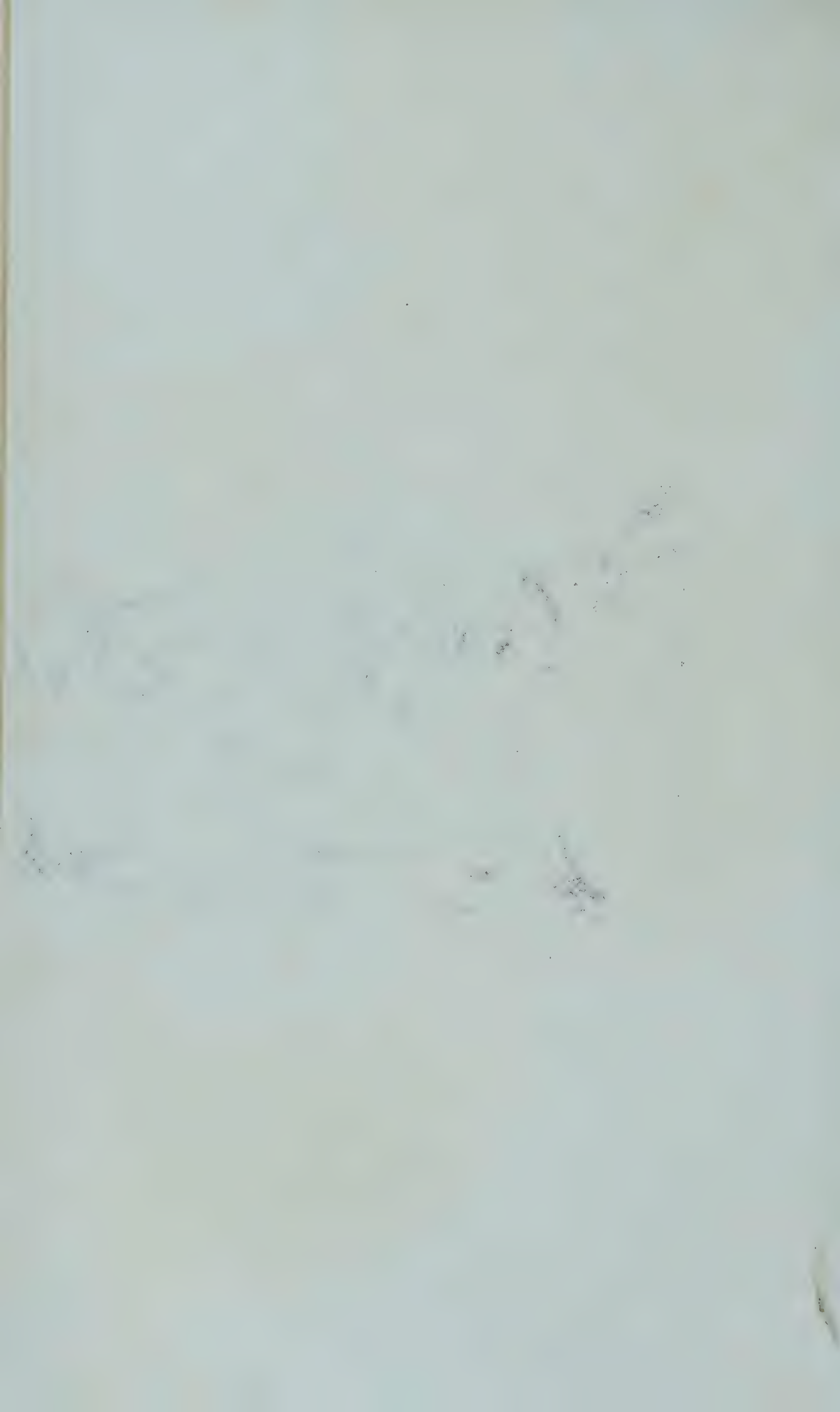




Algerian Oats between maize crop after last cultivation, black vlei land,  
Makwiro district. Photographed end of April, 1914.







The effect of growing fine-strawed fibrous-rooted crops such as wheat, oats or barley, which also leave a stubble to be turned under, is immediately noticeable. After these crops, the soil, being permeated with fine rootlets, ploughs up loose and mellow, and hard clods are remarkable by their absence. Under such conditions, all that is required to bring it into order for seeding is a disc or spike harrowing, whereas after continuous maize cropping the clod crusher and disc harrow must often be used several times before a suitable seed bed can be obtained. Needless to say, a rotation of maize and oats alone is not suggested, but summer oats may well replace manna to a certain extent, and, while benefiting the soil equally, will produce fodder of superior feeding value.

**OATS FOR PASTURAGE.**—Late sown oats form excellent autumn or winter grazing. This is an aspect which should appeal particularly to dairy farmers on relatively small farms where natural grazing is scarce. On moisture-retaining soils, oats may be sown broadcast between the maize about the time of the last cultivation. They will assist in keeping down weeds, and after the ears have been harvested the land will afford magnificent mixed grazing of maize and oats. They may also be put down as a pure sowing for pasturage either on red or black soils, in which case the date of seeding and choice of variety will be governed by the character of the soil and the time when the green feed is most required.

Given proper handling and knowledge of its requirements, oats can be rendered one of our most valuable crops for home feeding. They can often be grown continuously throughout the entire year, and can be used for grazing, hay, forage and sometimes also for grain. Even in seasons of severe rust epidemic, the oat crop need never be a financial loss. It is, however, essentially the mixed farmer's crop, and should be grown primarily for home use and not for sale, since this, with a limited local market, is often uncertain.

## Hints for Tobacco Growers.

By "MUFUNGI."

Now that growers have realised that quality and not quantity is the essential for success, a few hints might not be out of place. I do not presume to lay down the law, but merely make a few suggestions as a basis for discussion amongst planters.

As regards seed beds, there is little to be said except to impress upon growers the need to raise strong, healthy plants. Constant supervision, no overcrowding in the beds, no drying out and no flooding. One teaspoon of seed for 50 square yards I find ample. Sow regularly and more than you require, and do not be afraid to hoe up the beds if the plants are getting big. So many of us keep on saying "Rain must come to-morrow," and when it does come our plants in the beds want topping, and it is too late to re-sow.

In more tropical countries—Sumatra, Cuba, Manila, etc.—it is the custom to erect a grass shade about 2 feet above the beds, and after the plants have germinated the cloth is off the bed all day and only put on after the evening watering. This tends to grow a stronger, hardier seedling, and adds to the life of the cloth. I also find that a very good thing is to plant beans in the beds directly after the plants are drawn: it keeps the beds clean, is profitable, and, if the plant is hoed in, replenishes the nitrogen.

When drawing plants, a very good "tip" is to make a dagga of kraal manure beside the beds, and dip the roots of each bundle of plants in it before putting them into the boxes for transport to the lands.

I think that planters will find that 3ft. 6in. is quite close enough in planting out. Some plants are lost per acre (I refer, of course, to those who plant 3ft. apart, as most do), but this loss is fully made up by the increased size of the leaf, due to the extra space and consequently longer cultivation, also to the fewer broken leaves.



Check-rowing I also strongly advocate, especially to those who cultivate mechanically. It stands to reason that if you have made up your mind that plants should be a certain distance apart for best results, if you check-row you get them that distance; also, should your plants fail after you have fertilised, you are able to replant in the same place, and thereby get the full benefit of the fertiliser at once. It is just as easy and as quick to check-row as not to.

As the whole idea of fertilising is increasing our profits, we must experiment further to find out what gives us the best return for our money, *i.e.*, what fertiliser and how much of it to use. The Agricultural Department has done a great deal to assist us, and we have been particularly unfortunate this year in our weather, as I understand that the drought has completely spoilt the tobacco manurial experiments that were being carried out on the experimental farm at Lochard. The Stapleford experiments gave us data to work on, and it is now up to us to experiment in a small way on our own. We can none of us "go the whole hog" and try a new fertiliser on the whole of our crop; and if we try an acre and get good results, the next year there are three more fertilisers, each one the "best on the market," and so our difficulties go on. We know that at present our best results have been attained with a complete dressing in the following proportions: Nitrogen 8 per cent., potash 10 per cent., and phosphoric acid (water soluble) 20 per cent., but we don't know how much of it pays us best: we all stick to two bags per acre.

This season the Chartered Company and the Tobacco Company of Rhodesia mixed their own complete dressing on the farms, but on account of the season it is not possible to say with what result. I know that in my own case, with two patches of Goldfinder planted during the same week, one fertilised with "Safco" and one with the home-mixed dressing, the result was quite satisfactory as regards quantity and exceedingly satisfactory as regards quality. There was also a saving of, I believe, £4 10s. per ton, without making allowances for buyer's commission, bank exchange and wastage, etc.

The new Fertiliser Ordinance should prove of great assistance to us if our friends the Director of Agriculture and his Department will come to our assistance and tell us what

is harmful to the crop. I mention this as it is quite easy to get a fertiliser mixed in the proportions given above, but which may contain various other constituents detrimental to quality. The majority of highly concentrated tobacco fertilisers are probably made up of double superphosphate, nitrate of potash and sulphate of ammonia. These make, I believe, the most concentrated form of complete dressing. They can also be made up with nitrate of soda, sulphate of potash and superphosphate, but in the latter case the crop is given a heavy dressing of soda, which is, I believe, detrimental to quality.

Analyses of various high grade fertilisers give the following:—

| Fertiliser.         | Percentage<br>of nitrogen. | Potash. | Soda. | Chlorine. | Sulphuric<br>acid. |
|---------------------|----------------------------|---------|-------|-----------|--------------------|
| Nitrate of potash   | 13                         | 44      | 1     | 1½        | ..                 |
| Sulphate of ammonia | 20                         | ...     | ...   | ...       | 70                 |
| Nitrate of soda     | 15                         | ...     | 33    | 2         | ...                |
| Sulphate of potash  | ...                        | 50      | ¼     | ...       | 54                 |

Thus, say we use 500lbs. nitrate of potash and 500lbs. sulphate of ammonia in one ton of complete dressing, we must substitute about 440lbs. sulphate of potash and 1,100lbs. nitrate of soda to get our nitrogen and potash, and thereby we supply 400lbs. soda.

When fertilising, I believe that the best results can be attained by applying half the fertiliser as soon after planting as possible and the remainder when the plants are fairly well grown. My reasons for this are that when exceptionally heavy rains fall, as they did in December, 1912, the fertiliser is dissolved at once and supplied to the plant as food in excess, unless it is washed away, and when the plant requires more there is none left. It stands to reason that as the plant grows bigger it requires more food, but with such soluble and easily available food in an exceptionally wet year it will probably get less. I know that in the season I quote, when planters all round were complaining about early flowering, I hardly had a single case of it, and I believe that the same applies to one or two growers in the Mazoe district who also fertilised twice.

To grow for quality and for quantity too, as only quality is saleable on the overseas market. I say prime higher and top lower. We are all inclined to try and grow too many leaves,

and as the boys pull off the big bottom leaves we shake our heads and mutter "Ikona mali," forgetting that off our seven or eight big middle leaves we are going to get twice as much as for three or four big coarse leaves broken by contact with the sand. Give the plants plenty of space, plenty of fertiliser, plenty of cultivation, a lot of care, and see that they grow nothing but leaves you can sell.

As to curing, I don't venture to suggest any method or formulæ. I do say, however, don't pick your leaf till it is very ripe, and don't try to cure too quick. In my opinion there would be a lot less tobacco only fit for insecticide if planters would learn the why and wherefore of everything they do when curing; learn a little physiology, learn what goes on in the leaf, and what changes take place during the sweating, yellowing and drying processes, and add observation and common sense.

I believe more harm is done in the very early stages than at any time. I know that in four of my five best barns, out of a total of about 200, the leaf hung in the barns for 48 hours without a fire and yellowed naturally; hence we must imitate nature. I also think that a great deal of sponging can be prevented by a freer use of the ventilators when the temperature is 110 degrees. Try and dry the leaf by draught, and not by heat; it gives you more to "veer and haul" on, if I may use a sailor's phrase.

In conclusion, a man who has spent all his life in the tobacco industry told me that the future of Rhodesian tobacco was in the side line business. Grow mealies with fertiliser, raise cattle to pay the expenses, and grow your 15 to 20 acres. Have plenty of barn accommodation, and don't try 40 acres and two barns. Content yourselves with a small acreage, but make it good. Leave the big acreages and the growing of inferior grades to the big companies and syndicates, who can afford small profits per acre and large acreages. You want big profits per acre, and they are there if you can grow the right leaf.

I can see many planters laughing and saying "We knew all you have said long ago." But if this poor screed has suggested one small thing to you it has done something; and if it brings thoughts, hints or suggestions from you it has done more.



## A Calendar of Crop Sowings.

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By H. GODFREY MUNDY, F.L.S., Government Agriculturist  
and Botanist..

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Once again the planting season is approaching, and not a few Rhodesian farmers may be seeding down new crops of which they have previously had little experience. Particularly will this be the case with crops grown as co-operative experiments, and it is, therefore, thought that for the more common Rhodesian crops brief notes on approximate dates of sowing, amounts of seed per acre, and soils best suited, may prove not unwelcome.

An observant farmer cannot fail to notice the important relation between the date of seeding and the resulting crop. Late sowing frequently spells almost entire failure to mature seed, especially in the case of ground-nuts and dhal, while with summer crops of oats and wheat the choice of a suitable soil is of primary importance. Only too frequently farmers conducting crop experiments, in co-operation with the Department, report unsatisfactory or even negative results, and in describing the experiment indicate that the soil they have chosen for the trial is exactly the opposite to that recommended. In such circumstances the crop is not given a fair chance, and farmers would undoubtedly be saved much disappointment and lost labour if they paid greater attention to choice of suitable soil and date of seeding.

Individual crops possess peculiarities which must always be taken into consideration when deciding the date of seeding. For instance, ground-nuts and dhal require a long growing season, and must therefore be planted early, while the latter, being a perennial crop occupying the land for several years, should be situated where it will not interfere with the follow-

ing season's ploughing. Forage crops, such as manna, millet and oats, can only be harvested in the best order if maturing towards the end of the rainy season, and the date of sowing should be regulated accordingly. Teff grass, on the other hand, is a quick-maturing crop which can either be seeded early and cut twice for hay, or used as a late catch crop, in which case only one cut is usually obtained.

Rainfall and climatic conditions vary so much in different districts of Rhodesia that it is not possible to fix arbitrary dates of seeding. Maize, the staple crop, is usually the one first planted, from the middle of November up to Christmas, or even occasionally later. It may be safely said, however, that plantings after Christmas seldom, except in abnormal seasons, give as good a yield as earlier sowings in November or mid-December. In the following notes the usual date for seeding maize is accepted as 15th November to 15th December, and other dates given should be considered as relative to this. In regions of light rainfall special attention should be given to preparation of the seed bed. Early seeding should be practised, and should be followed by constant cultivation, in order to check evaporation. Almost all crops thrive better when drilled than when broadcasted, since the seed, being planted deeper, germinates more uniformly, and cultivation is rendered easier. Summer crops of wheat, oats, manna and teff grass require a firm seed bed, and are benefited by rolling and sometimes harrowing when the plants are a few inches high. Rolling is especially desirable in the case of teff grass.

**MAIZE.**—For grain production sow from 15th November to Christmas, approximately, and for silage from 5th to 20th January. The usual distance of planting is drills about 40 inches apart and seed 15 inches in the row. Silage maize may be planted in January, 30 inches by 15 inches, or even closer.

**ROOT CROPS.**—All root crops require a fairly heavy and fertile soil if good returns are to be obtained. Usually a dressing of 6 to 8 tons of dung per acre should be given, and in addition at least 50 to 100 lbs. of complete artificial fertilisers. Mangels and sugar beet should be sown not later than Christmas, in continuous drills 24 to 30 inches apart, the plants later being thinned out to stand 10 to 12 inches apart.

in the rows. Sow 6 to 10 lbs. seed per acre. Carrots and kohlrabi may be sown on lighter soils early in January, in drills about the same distance apart, or slightly closer, and thinned out to stand 6 to 10 inches apart in the rows. The amount of seed sown per acre is 8 to 10 lbs. and 3 to 4 lbs. respectively. Cattle radish, rape, thousand head kale and turnips may be seeded similarly to kohlrabi, but these crops are rather unreliable, owing to attack by aphid and saw-fly caterpillar.

**PUMPKINS AND CATTLE MELONS.**—Early sowing in December usually gives the best results. Manured land is recommended, and planting in hills 8 feet by 8 feet to 12 feet by 12 feet; 2 to 3 lbs. seed per acre. Cattle melons are better suited to poor soils and districts of light rainfall.

**BEANS** thrive best in rather heavy soils. Sow velvet beans in drills 3 feet by 2 feet apart about the middle of December, or a fortnight later if for silage. Use 25 lbs. seed per acre. Cowpeas are quicker to mature, and do better on poor sandy soils. Sow early in January in drills 2½ feet by 1½ feet; 30 to 35 lbs. seed per acre. Beans of the haricot or Canadian Wonder type can be sown from December to early February in drills 2 feet by 8 to 12 inches; 50 to 60 lbs. of seed per acre is needed. Many of the most successful growers recommend late planting and heavy seeding, especially on soils which retain moisture well.

**LINSEED** requires a moderately rich and heavy soil. Sow from 1st to 10th January, in drills 8 inches apart or broadcast. In drilling, about 25 lbs. of seed per acre is required, and in broadcasting 30 to 35 lbs.

**GROUND-NUTS** are best suited to light loamy soils. Plant from 15th November to 15th December in drills 30 to 36 inches apart by 12 to 20 inches distant in the row. About 30 lbs. shelled seed per acre, or 40 to 50 lbs. unshelled will suffice.

**CASTOR OIL BEAN** should be planted as early in the rainy season as possible in hills 4 by 3 feet apart, dropping 2 to 3 seeds in each hill, and later thinning out to one plant. The seed required per acre is 2 to 3 lbs. In the second season, cut out alternate plants and alternate rows, leaving the bushes 6 by 8 feet apart.

**SUNFLOWER** prefers rich fertile soils, but will also grow on poor sand. Sow 6 to 10 lbs. of seed in continuous drills



3 feet apart during December. When the plants are a few inches high, thin out to stand 12 to 15 inches apart in the rows.

BUCKWHEAT does best on red loamy soils, but can also be grown successfully on black sandy or turf soils. It requires 10 to 12 weeks to mature, and should be sown about the middle of January to ripen towards the end of the rainy season. Sow broadcast 30 to 40 lbs. seed per acre.

KAFFIR CORN may be treated as recommended for sunflower, but should be sown in November or early in December, and at a slightly wider spacing.

DHAL grows well on all soils, but is sensitive to frost. It should be planted as early as possible in frost-free situations (not in low-lying ground) in drills 3 by 2 feet apart. About 6 lbs. seed per acre is needed. This crop is perennial.

SUMMER WHEAT, BARLEY AND OATS should always be sown on high lying red or sandy soils. Black soils are especially unsuitable for summer wheat or barley. Drill or broadcast during the first week in January at the rate of 60 to 90 lbs. seed per acre. (For further particulars see article on oats in this issue.) Seed should always be treated with bluestone or formalin as a preventative against smut.

MILLETS.—Boer manna requires about 5 months to mature, German and Japanese millet about  $3\frac{1}{2}$  to 4 months. The latter is best suited to heavy wet vlei soils; broadcast, 10 to 15 lbs. seed per acre.

TEFF GRASS, if sown as a catch crop, may be put in as late as 20th January, but as a main crop the best results are obtained by seeding about Christmas time; broadcast, 5 to 7 lbs. seed per acre, mixed with four times its bulk of sand or dry sifted earth; harrow with a bush harrow or weeder. A heavy harrow is apt to bury the small seed too deeply. Grows well in sandy vleis or on red or black soils.

LUCERNE is best sown in drills from 15 to 20 inches apart—during cloudy weather in January. If under irrigation it may be seeded in March or August to September; 9 to 12 lbs. seed per acre. Lucerne requires a deep well drained soil. The same remarks apply to Florida Beggar Weed.

POTATOES (IRISH).—The main crop is planted from December to end of January. Spring crops under irrigation or on naturally moist land—August or earlier if frosts are not prevalent. These early crops will not keep, and must be lifted and marketed as soon as ripe. The amount of seed tubers required per acre is 1,200 to 1,500 lbs., depending on size.

SWEET POTATOES thrive best on light loamy or sandy soils, and are best established in November or December from sprouted tubers, rooted slips or cuttings. A common method is to plant out cuttings in February between the maize crop, when the potatoes will mature about 15 months later. After the maize is reaped, and the cut stalks removed from the field, the land should be disc or spike harrowed and then left for the potatoes to resume their growth the following October. Distance of planting is about 3 by 2 feet.

NAPIER'S FODDER is a great drought-resister, but sensitive to frost. It should be kept on high lying land, and not planted in vleis soils, which are usually too subject to frost. It can be established by cuttings or rooted slips any time during the wet season in hills 3 by 3 feet apart. Napier's fodder is doing well both on red and sand soils. Approximately 5,000 cuttings are required to plant an acre.

SUGAR CANE grown for forage is planted in the same manner as Napier's fodder.

WINTER PASTURE GRASSES all appear to require moisture-retaining soils in this country. Paspalum and burnet may be sown broadcast from December onwards; the fescues are better seeded down in January. Twenty to 30 lbs. seed per acre, except in the case of paspalum, with which 10 to 15 lbs. is sufficient.

ANNUAL FIBRE CROPS.—Hemp, jute and Sunn hemp should all be sown early in December on as fertile soil as possible. Jute and hemp will probably do best in heavy moist vleis soils. Sunn hemp is the one most likely to thrive on poorer and dryer soils. Sow broadcast or in rows about 8 to 12 inches apart, and thin out the plants to stand from 8 to 12 inches distant in the rows. Of hemp, about 40 lbs. of seed is required to sow an acre; jute 12 to 20 lbs., and Sunn hemp 50 to 75 lbs. per acre.

## Crop Returns at the Botanical Experiment Station, 1913-4.

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By J. A. T. WALTERS, B.A., Assistant Government  
Agriculturist.

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This first attempt to give a complete list of the crop results obtained on the Botanical Experiment Station, Salisbury, is the outcome of requests by numerous farmers who visit the place in the course of the season. The total area of land under crops is about 50 acres, and crops are necessarily grown on a small scale, generally in quarter or half acre plots, less frequently in one or two acre plots. For the determination of yields on a bigger scale the crops are transferred to the Gwebi and Longila Experiment Farms. The returns obtained at this station, however, represent what may reasonably be expected under normal conditions of cultivation, for in no case are any methods employed that are not accessible to the farmer. Neither manure nor artificial fertilisers are applied directly or indirectly to any crop, unless special mention of the fact is made. Similarly with tillage operations, no more labour is expended on the crops than should be practised in the ordinary way by Rhodesian farmers conducting their land management on up-to-date lines. Some form of rotation is followed each year, but not necessarily with a leguminous crop. It naturally follows that few abnormal results are obtained, and that yields represent only what the farmer may reasonably expect under favourable conditions. Thus in 1913 a yield of 37 bags of Spanish ground-nuts per acre was obtained, and in the same season 18 bags of maize per acre, in both cases after a previous crop of oats, and unmanured. Reports from private farms shew that the former result has been equalled on a large scale this season in the Umtali dis-



trict, while the third year residual manurial trials at the Gwebi Experiment Farm have returned 17 bags of grain per acre.

In 1913-14 two results deserve special attention: the yield of over 6 bags of Yellow Cross wheat per acre, grown after velvet beans the previous season, and a yield of 5.8 bags of Nepal barley after teff grass. A return of 6 bags of dhal on second-year plants is also to be noted, these plants having been cut down last season to within 8 inches of the ground and allowed to grow again.

The Botanical Experiment Station shared the scanty rainfall that prevailed last season almost all over Rhodesia. Many of the early sown crops failed to survive after a good germination, and had to be re-sown later. Among the crops that suffered in this way were the maize-breeding plots, sunflowers, cow-peas, velvet beans, Egyptian clover and castor beans, all of which were seriously handicapped by a late sowing in January, resulting in greatly reduced yields.

The average annual rainfall at the station is about 30 inches. This last season only 21.22 inches fell, and practically the whole of this was recorded during a period of seven weeks, commencing on the 8th of January. The following table shews the rainfall for each month:

| 1913.            | Inches. | 1914.           | Inches. |
|------------------|---------|-----------------|---------|
| August ... ..    | 0.21    | January ... ..  | 5.82    |
| September ... .. | 0.90    | February ... .. | 10.04   |
| October ... ..   | 0.78    | March ... ..    | 0.13    |
| November ... ..  | 1.68    | April ... ..    | 0.80    |
| December ... ..  | 0.86    |                 |         |

The subjoined list is by no means exhaustive of the crops grown on the station. New introductions were dealt with in the last issue of this *Journal*. Other crops are being dealt with in separate articles, but this list shews, for the common crops of Rhodesia, the precise date of seeding, the period of maturing during the season under review, and the crop grown the previous season on the same soil.

| Crop                          | Sown  | Period of Maturity                        | Yield per acre  | Previous Crop                 |
|-------------------------------|---|---|-----------------|-------------------------------|
| Wheat : Victoria ...          | 20-12-13  | 5½ months                                 | 740 lbs.        | Buckwheat                     |
| Le Roux ...                   | 12-1-14   | "   | 230 "           | Yams, unmanured               |
| Bishop ...                    | 5-1-14  | 5 months                                  | 400 "           | Potatoes, "                   |
| Yellow Cross ...              | "   | 3½ months                                 | 1,240 "         | Velvet Beans                  |
| Barley : Swedish ...          | 3-1-14  | "   | 720 "           | Rape                          |
| Nepal ...                     | 5-1-14  | "   | 1,160 "         | Teff Grass & Clover           |
| Oats : Sixty-day ...          | 2-1-14  | "   | 860 "           | Pea-nuts                      |
| Snymra ...                    | "   | 4½ months                                 | 860 lbs. grain  | Maize                         |
| Oat Hay : Texas ...           | "   | 4½ months                                 | 4,000 lbs.      | Pea-nuts                      |
| Algerian ...                  | "   | "   | 4,136 "         | Maize                         |
| New Zealand ...               | "   | "   | 3,000 "         | "                             |
| Sidonian ...                  | "   | "   | 4,600 "         | "                             |
| Dhal : Perennial ...          | Dec., 1912  | "   | 1,200 "         | Dhal                          |
| Beans : White Canadian ...    | 18-12-13  | 4½ months                                 | 480 "           | Sunflowers                    |
| Red Canadian ...              | "   | "   | 360 "           | "                             |
| White Haricot ...             | "   | "   | 440 "           | "                             |
| Natal Sugar ...               | "   | "   | 314 "           | "                             |
| Peas : Ringleader ...         | } best<br>earlies<br>best late<br>varieties<br>ties | } Row trials.<br>weights<br>not recorded. | Acre<br>not re- | { Linseed<br>"<br>"<br>"<br>" |
| Favourite ...                 |   |   |                 |                               |
| Solo ...                      |   |   |                 |                               |
| Main Crop ...                 |   |   |                 |                               |
| Capital ...                   |   |   |                 |                               |
| Linseed : White flowering ... | 22-12-13  | 4½ months                                 | 560 lbs.        | Teff Grass                    |
| Yellow seeded ...             | "   | "   | 440 "           | "                             |
| Large seeded ...              | "   | 4¾ months                                 | 540 "           | Vetches                       |
| Riga ...                      | "   | 4½ months                                 | 260 "           | Teff Grass                    |
| Pskoff ...                    | "   | 4¾ months                                 | 420 "           | "                             |
| Pea-nuts : Spanish ...        | 10-12-13  | 6 months                                  | 476 "           | Majorda Melons                |
| Virginia Bunch ...            | "   | 6½ months                                 | 776 "           | "                             |
| " Runner ...                  | "   | "   | 784 "           | "                             |
| Tennessee ...                 | "   | 6 months                                  | 548 "           | "                             |
| Carolina Red ...              | "   | "   | 496 "           | "                             |
| Cow-peas : New Era ...        | 23-12-13  | 4 months                                  | 510 "           | Wheat                         |
| Natal Black ...               | "   | "   | 432 "           | "                             |
| Taylor ...                    | "   | "   | 315 "           | "                             |
| Red Ripper ...                | "   | "   | 360 "           | "                             |
| Buckwheat : Japanese ...      | 13-1-14   | 2½ months                                 | 1,840 "         | Cow-peas                      |
| Silver hulled ...             | "   | 2¼ months                                 | 1,380 "         | "                             |
| Soy Beans : Southern ...      | 23-12-13  | 4¾ months                                 | 183 "           | Maize & Pea-nuts              |
| Sakura ...                    | "   | "   | 180 "           | "                             |
| Sunflowers : Striped ...      | 12-12-13  | 5 months                                  | 480 "           | Soy Beans                     |
| Russian ...                   | "   | 5¾ months                                 | "               | "                             |
| Castor Beans : Annual * ...   | 1-12-13   | 5½ months                                 | 300 lbs.        | Wheat                         |
| Perennial (8' × 8') ...       | Dec., 1912  | (23 trees)                                | 300 "           | Castor Beans                  |
| Hay : Teff and Clover ...     | 20-1-14   | 3½ months                                 | 2,270 "         | Sweet Potatoes                |
| Teff and Peas ...             | "   | "   | 1,840 "         | Clover                        |
| Manna & Vetches ...           | "   | 4 months                                  | 1,366 "         | Cotton (failed)               |
| Melons : Majorda ...          | "   | 5 months                                  | 5.1 tons        | Chicory                       |
| " ...                         | "   | "   | 8.9 "           | Barley and Rye                |

\* Land manured the previous year with double complete Saeco, 200 lbs. per acre.

N.B.—Half sugar and mammoth long red mangels, also red Danish and Vilmorin's improved sugar beets, were sown on well manured land in the second week of December, but, owing to drought, the yields were so small as to be undeserving of record.

## Poultry Keeping for the Rhodesian Farmer.

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By FRANK SHEPPARD.

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It is only within recent years that the progressive farmer has realised that poultry on a farm, if kept on proper lines, not only pay, but pay well, and in many cases the gross return per head in proportion to its keep is much greater than that of any other live stock. A few kinds of all breeds and ages kept round the homestead do not pay, and as so many farmers have found this to be the case they will not venture to take up poultry keeping on a larger scale. In England and many other countries the colony system has been proved to be the most suitable for farmers. This system of keeping flocks of about 30 birds in small movable houses on different parts of the farm is the most economical, and therefore the most profitable form of poultry keeping. This system has many advantages over the old method of keeping the birds round the farm buildings. The farmer is able to keep more birds, the cost of feeding is greatly reduced, as, with unlimited range, the birds will pick up quite half their food and are much more healthy than those kept in confinement; also there is a saving in wire netting. In Rhodesia one cannot carry out the colony system exactly as it is in England; that is with the houses on the stubbles in the meadows or on freshly ploughed land, owing to the absolute necessity of shade. We must have our houses placed amongst large trees which give better shade than low thick bush, as they allow a free passage of air. One of the disadvantages of this system in Rhodesia is that as we are unable to run our birds on cultivated land, we lose a great amount of the manure, except, of course, when birds can range amongst fruit trees.



It is a great mistake for the individual with limited experience to start poultry keeping on too large a scale. He must commence with one or two pens and make up his flock, gaining experience as he goes. When economy has to be observed, the best way to start is to buy sittings of eggs or day old chicks from a reliable breeder, but I do not advise either of these methods in Rhodesia. Unless the eggs can be bought locally, there seems little chance of success. I have heard of so many cases of eggs, after having travelled three or four days on the railway, giving unsatisfactory results. With regard to day old chicks, of course there is a limit to the distance these can travel, and it would not be advisable for the novice to have 50 or so tiny exhausted chicks thrust on his hands at short notice. In Rhodesia I consider by far the most satisfactory way is by purchasing properly mated up breeding pens from a reliable breeder who specialises in the variety required. It must not be forgotten that future success depends almost entirely on first-class breeding stock being obtained at the outset. The question is often asked, "Which is the best variety for the farmer?" I think the only possible answer is that "there is no best variety," just as there is no best breed of cattle. It depends upon circumstances, and the individual must decide for himself which variety will suit his purpose. No doubt a general purpose variety is the most useful to Rhodesian farmers, and this being the case, it is possible to name the most suitable varieties, but to the individual, till it is known which line of the poultry industry he intends to follow, it is impossible to do so. One frequently notices, by the way, when talking to poultry breeders, the word "breed" is used when "variety," or "sub-variety" is meant. A variety is a definite branch of a breed. White Leghorns are a variety of the Leghorn breed, rose-comb White Leghorns are a sub-variety of White Leghorns.

Although the farmer's knowledge of poultry keeping is usually somewhat limited, he will find, if he decides to take up the production of eggs and table birds more seriously, that his knowledge of cattle will give him considerable assistance in the early stages until he is thoroughly acquainted with the birds and their wants. There are many details, I admit, in connection with the work which can only be learnt

by experience with fowls. He will not find his knowledge of cattle helps him much with regard to the care and feeding of laying hens, the management of breeding pens, the treatment of birds during the moult and the care and rearing of young stock, and so on, but he will find that in the selection of the breeding stock, the introduction of fresh blood and the principles of breeding either for eggs or table birds are almost identically the same as breeding for dairy or beef cattle. Before a start is made the market must be considered and a decision arrived at as to which line of the business will bring in the highest returns. It is essential that there should be a definite line to work upon from the start with one object in view—either eggs or table birds. If it is intended to build up a business on a large scale, the two branches of the industry must be kept strictly separate and run on different lines. There must be no indiscriminate crossing between the layers and the table birds and their treatment must differ. If the poultry on the farm receive the same care and attention as other live stock, the farmer will have no cause to regret having taken them up as something more than a side line.

If it is decided to go in for egg production alone, White Leghorns and White Wyandottes will be found the most suitable varieties. In the making of a dairy herd the farmer would import Frieslands or some other breed from a herd with a high milking record; so must he obtain his breeding pens from the best egg-laying strain that is possible. For the production of eggs strain is everything. In laying competitions all over the world we find the same varieties holding both the highest and lowest positions. In a good laying bird we see some of the same characteristics to be noticed in the good milker. In the case of the layer we also see a tight, glossy plumage and a bright full comb. There are some, no doubt, who will take exception to my remarks as to White Leghorns and White Wyandottes being the best varieties for egg production, but I consider they have proved themselves to be this. In laying contests in England, Australia, South Africa and America these two varieties have held the leading positions. In the English Utility Poultry Club's 12 months' contest, which has now been running 9 months at the Harper Adams College, White Wyandottes hold the first, second, fourth and



fifth positions and White Leghorns the third. In the Sedlescombe competition after 9 months White Leghorns occupy the first, second, fourth and fifth positions, and White Wyandottes the third in the small house section; and in the semi-intensive section the second; third and fifth places are held by White Leghorns, and the first and fourth by White Wyandottes. In the No. 1 section, which is open to the world, of the South Australian laying contest now being held at the Government Poultry Station, Parafield, pens of White Leghorns are first, second, third and fifth, whilst the only pen of White Wyandottes in that section holds the fourth position. The No. 1 pen White Leghorns and No. 4 pen White Wyandottes are both from England, and at the same time birds from these strains are leading in the North American contest—I think the White Leghorns.

There is not yet a market in Rhodesia to make it worth while for the farmer to go in for table poultry on a large scale, rearing and fattening really first-class table birds as, say, Brahma-Dorking cross weighing 16 lbs. a pair, but there is room for improvement on the Yokohama-Bantam type of bird which we see so much of at present, weighing 16 ounces. Of course size is what we want chiefly in table poultry; still it is not everything. In judging a table bird 25 points are given for size and quality, 30 for youth, quality and quantity of breast meat, 25 for straightness of keel (the upright blade of breast bone), fineness of bone, absence of offal and surplus fat, and 20 for general marketable appearance, colour of skin, etc.; total 100 points. The ideal table bird of large size, with white legs, flesh and skin, fine bone, small amount of offal and a deep, broad and long carcase is practically impossible to obtain, but we must do our best to produce a bird which combines as many of these points as possible. There are many well known crosses for breeding table birds, and I consider Xaverelle-Buff Orpington would be suitable for Rhodesia. When breeding for size it must be remembered we get this from the hen, therefore we must select large Buff Orpington hens to mate with our Salmon Xaverelle cockerel. Indian Game-Dorking is also another useful cross. As regards pure-breeds for table purposes, I see no reason why Sussex should not thrive in Rhodesia, and one or two strains of the red and



speckled varieties have proved themselves quite above the average as egg layers. Although at present there seems to be no demand for really good table poultry, I think it is a case in which the supply would create the demand, and if sold by weight, it is to the advantage of the breeder and more satisfactory to the customer.

Taking everything into consideration, the farmer will find, I think, that the general purpose fowl is the most profitable: one which combines hardiness, egg-laying and table qualities, and also is a good forager. There will be a great difference of opinion as to which variety possesses these qualities, but I feel sure that White Wyandottes, Buff Rocks, Rhode Island Reds, Buff Orpingtons, Barred Rocks and White Orpingtons, in the order named, will prove themselves the best general purpose varieties suitable for Rhodesia, provided, of course, they are obtained from really first-class strains.

In a future article I hope to deal fully with rearing and keeping poultry on the colony system.

## Rye.

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By J. A. T. WALTERS, B.A., Assistant Government  
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This crop is worthy of greater attention than has hitherto been paid it in Rhodesia. Its high value as a pig feed has long been known and recognised. What has not been sufficiently realised in this country is its adaptability to the vast tracts of sandy soil which are unsuited, naturally, for the culture of wheat and oats. Experience has shewn that sandy soil invariably gives the best quality of grain in the case of rye. And not only can it be successfully grown as a summer crop, but in damp vleis, which are sandy in character, it is particularly well adapted for winter fodder purposes, giving an earlier return of green fodder than any of the other crops grown for this purpose. The best results as a summer grain crop have been obtained when grown in rotation on manured tobacco soils, for which purpose it is eminently suited.

Rye has proved resistant to rust in this country, and is not usually seriously injured by frost; but to what extent it will withstand drought, as compared with wheat and oats, has not yet been definitely ascertained. It dislikes stiff heavy soils, and runs to stalk on damp soils rich in humus. Rye and buckwheat are frequently called poverty crops, on account of their adaptability to poor conditions of soil, and it seems not improbable that rye may offer some solution to the problem of utilising the poorer tracts of granite veld both as a summer grain crop and as a winter fodder crop on irrigated land or on damp vleis that are naturally too poor to carry oats or barley.

American and Danish feeding tests shew that in the case of pigs rye grain has a feeding value equal to barley. Analyses of the crop cut as fodder prove it to compare well

with oats and barley. It is imperative, however, that for hay rye should be cut before the seeds set, as the stalks rapidly become fibrous and unpalatable after reaching that stage.

The general treatment and cultivation of rye resemble those of wheat. About 60 lbs. of seed are required per acre, and this may either be sown broadcast or drilled. For a summer crop it is advisable to sow about the first or second week of December, and for a winter fodder crop in March or April, according to the rains.

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## Correction.

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In the article on ground-nuts appearing in the August issue of the *Journal*, on page 880, line 10, it is stated that a mud sack usually holds 100-110 lbs. shelled nuts. This was a typographical error, and should have read 170-180 lbs.



## Extracts from the Report of the Government Agriculturist and Botanist for the Year 1913.

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CANADIAN AND AMERICAN TOUR.—During my leave, two months of which was special extension granted for the purpose, I made a rapid tour through Canada and part of the United States of America, in the course of which many of the best known Provincial and State Departments of Agriculture, Colleges of Agriculture and Experiment Stations in America were visited. Special reports on the various aspects of this tour have been submitted, and it is sufficient to say that much of interest was learnt, and many introductions of new varieties of seed not yet in commerce were arranged for. I take this opportunity also of expressing my indebtedness to the various officials connected with agriculture in Canada and the United States of America for the cordial welcome and unstinted assistance which I received from them. Not the least important object of the tour was an enquiry into labour-saving machinery for handling maize, beans and ground-nuts, and in this respect the information gained was somewhat disappointing. Certain Rhodesian firms are now following up our enquiries with a view to importing trial outfits for dealing with the two latter crops, but the high cost of such machines is a serious hindrance, unless they can be operated here on the co-operative principle. In regard to maize, the objective was the most reliable type of maize harvester or binder, but as far as I was able to ascertain none of these machines are as yet entirely efficient, while their considerable cost and short working life render it uncertain whether they would prove a profitable investment for the Rhodesian farmer. Efforts are now being made to organise a demonstration of such machinery on the Gwebi Experiment Farm during the coming year, and until this has been carried out and the machines have been thoroughly tested on Rhodesian crops, I am not in a position

to make definite recommendations. From an investigation of conditions obtaining in British Columbia, where hops are grown on a considerable scale, it appeared there might be some prospect for this crop in Rhodesia, and in consequence a number of "sets" of four of the most promising varieties have been introduced for trial. The South African Breweries are adopting a forward policy in this respect, and are also distributing sets to farmers for trial, some hundreds of plants being promised for Rhodesia.

**THE BOTANICAL EXPERIMENT STATION.**—The rainfall at this station amounted, between the months July, 1912, and May, 1913, in all to 29.84 inches. The area of land actually under crops totalled 35 acres, of which ten acres were new land on the 25-acre extension granted us in August by the Salisbury Municipality. More than 300 experimental sowings were made, many of which were variety trials and new introductions.

**SUB-SOILING WITH DYNAMITE.**—In view of the reports regarding the advantages of thus treating land, a quarter acre of virgin soil was sub-soiled as follows: In June, 1912, charges were placed 3 ft. deep and 8 ft. apart each way. After these had been exploded, the land, together with two adjoining quarter acres of untreated virgin soil, was ploughed and later cross-ploughed. The quarter acre of sub-soiled land was thus flanked on either side by untreated land, and the same crops, namely: maize, Victoria wheat, linseed, Egyptian clover and Kaffir beans, were sown in strips right through, the centre of each being on the sub-soiled land. The plots were uniform throughout, and none of the crops shewed the slightest advantage from this method of sub soiling. The benefits may be more noticeable in the second year, but the present inference is that comparatively shallow rooting annual crops will not profitably repay such treatment, and this indeed is what might be expected.

**Co-OPERATIVE EXPERIMENTS.**—During the year 1912, 140 farmers participated in the free summer distribution of seeds for co-operative experiments, while in 1913 the number increased to 196. To these farmers the following quantities of seed were issued in 602 separate packages:—

|   |     |     |     |     |                    |
|---|-----|-----|-----|-----|--------------------|
| Summer wheat, oats, barley and other<br>cereals | ... | ... | ... | ... | 2,600 lbs. approx. |
| Beans and peas, including pea nuts              | ... |     |     |     | 961 ,, ,,          |
| Root crops                                      | ... | ... | ... | ... | 209 ,, ,,          |
| Pasture plants and grasses                      | ... |     |     | ... | 900 ,, ,,          |
| Miscellaneous crops, including oil seeds        |     |     |     |     | 470 ,, ,,          |

Sixty-four farmers participated in the distribution of winter cereal seeds for trial under irrigation or in moisture-retaining vlei soils, the amounts of seed issued being:—

|        |     |     |     |     |                    |
|--------|-----|-----|-----|-----|--------------------|
| Wheats | ... | ... | ... | ... | 1,060 lbs. approx. |
| Oats   | ... | ... | ... | ... | 1,625 ,, ,,        |
| Barley | ... | ... | ... | ... | 790 ,, ,,          |
| Rye    | ... | ... | ... | ... | 440 ,, ,,          |



## Extracts from the Report of the Agricultural Chemist for the Year 1913.

SOILS.—The number of applications for advice regarding soils, the crops for which they are most suited, and the manurial treatment recommended, continues to increase, and in many cases it is now possible, with the local knowledge that has been acquired, to give practical information without recourse to a detailed soil analysis, although in others, more particularly in the case of virgin country and areas in which soils presenting abnormal features are met with, it is necessary to submit the soils to analysis before reporting thereon. During the year, particular attention has been directed to the examination of magnesian soils occurring on the Great Dyke, and the results of this work promise to afford information of far-reaching practical and scientific importance. In my report for the year 1912, attention was drawn to some "Dyke" soils and to the poor crop returns obtained therefrom, the reason for which was attributed to the presence of an excessive amount of magnesia. The scientific investigation of magnesian soils presents a field of enquiry which has been little explored, and, in view of its importance in this Territory, the work on these soils has been followed up in the laboratory and in the field with a view, on the one hand, to acquiring information regarding the tolerance of different farm crops to magnesia and the best methods of soil treatment, and, on the other, to devising a means whereby the analyst can determine the suitability or otherwise of soils containing unusually high proportions of magnesia for arable farming. In order to gain additional information and corroborate the results already obtained, special attention will be paid to the field returns obtained during the present season, at the close of which a report upon the investigation to date will be submitted.

**MOISTURE IN MAIZE.**—During the period from October, 1912, to July, 1913, an enquiry was conducted into the variations which occur in the moisture content of stored maize as the result of changes in the condition of the weather. A determination of the amount of moisture present in export maize is of particular importance, on account of the fact that grain at the time of shipment should not contain more than 12 per cent. moisture if heating and damage in transit are to be avoided; consequently, maize containing more than this amount is rejected for export by the Government Grain Inspectors of the South African Union. For the purposes of the enquiry into the moisture content of locally-grown stored maize, 12 sacks of maize from consignments forwarded by 12 growers to the Salisbury Farmers' Co-operative Society were set aside in the Society's store, and samples were periodically taken therefrom for moisture tests. It was observed that the mean moisture content of the 12 samples varied with the humidity of the atmosphere, the lowest and highest mean moisture contents being concomitant with the lowest and highest humidity conditions respectively. The maximum variation in moisture recorded during the period of the investigation (mean of 12 sacks) was 3.72 per cent., the lowest average—7.97 per cent.—being shewn in the month of October, 1912, and the highest—11.69 per cent.—in April, 1913. In single bags the maximum variation in moisture for the same period was 4.6 per cent. and the minimum 3.3 per cent. The conclusions drawn from the enquiry were that during the wetter months of the year the moisture in some consignments of stored maize is very near the danger point for export, and that in all cases the grain must be shipped immediately on arrival at Beira.

**CATTLE DIP.**—The number of samples of cattle dip from public and private dipping tanks submitted for report as to the strength thereof has increased considerably compared with previous years. In several cases loss of cattle has occurred owing to the dip in private tanks being much over the prescribed strength, and in others the dip was found to be much too weak to be effective. The value of this work is therefore apparent, in that it may prevent loss of cattle on the one hand, and on the other enable the farmer to adjust the strength, and thus save the expense of making up new dip.

SUMMARY OF ANALYSES.—A classified list of the samples analysed during the past year is presented in the following table: —

|                                   |     |     |     |     |           |
|-----------------------------------|-----|-----|-----|-----|-----------|
| Soils                             | ... | ... | ... | ... | 78        |
| Limestones and travertines        | ... | ... | ... | ... | 12        |
| Cattle dips                       | ... | ... | ... | ... | 109       |
| Animal viscera, etc., for poisons | ... | ... | ... | ... | 20        |
| Maize moisture tests              | ... | ... | ... | ... | 79        |
| Fertilisers                       | ... | ... | ... | ... | 6         |
| Milks                             | ... | ... | ... | ... | 112       |
| Wattle and indigenous barks       | ... | ... | ... | ... | 13        |
| Waters                            | ... | ... | ... | ... | 4         |
| Oil beans                         | ... | ... | ... | ... | 2         |
| Miscellaneous                     | ... | ... | ... | ... | 13        |
|                                   |     |     |     |     | <hr/> 448 |

In addition to the above, 50 samples of soil were submitted to qualitative examination and reported upon.



## The Agricultural Outlook.

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The majority of progressive farmers now have their lands ready for sowing, though, unfortunately, we fear there are not a few who still await the advent of early rains before commencing to plough.

It is to be hoped that we shall be favoured with early and continuous rains, since a successful season will probably enable us to render valuable assistance in helping to make good the shortfall in foodstuffs likely to occur in Europe as a result of the war.

Reports from various sources go to shew that farmers are weathering the long dry season satisfactorily, and that cattle, although they have naturally fallen off in condition, are as a rule healthy and free from disease.

Grass fires have devastated large areas, particularly in certain districts, in spite of all precautions, but the grazing generally is better than usual at this time of the year, and supplemented by the larger amounts of stock feeds laid by, should suffice to carry stock over until the rains arrive. Prosecutions for infringements of the Herbage Preservation Ordinance have been rigorously conducted whenever the culprits have been found, and the penalties inflicted should act as a deterrent for the future. It is worthy of remark that grass fires appear to be more prevalent in areas of European settlement and in the vicinity of roads and railways.

Generally speaking, scarcity of water is at the present time causing more anxiety than shortage of food. It is pleasing to observe that farmers throughout the Territory are sinking wells to a much greater extent than heretofore, and, from what can be seen, well sinking for stock purposes will be the salvation of Matabeleland. Shallow dams for the storage of storm water, except where there is a perennial inflow of

water sufficient to counteract the heavy evaporation and absorption losses, are not to be recommended. Farmers may be urged to sink wells wherever needed, and we would like to warn them not to place entire reliance upon pools in streams (which have the reputation of having never previously dried up) or upon "misenyas" and other similar superficial sources of water supply. Most subterranean water supplies in this country are obtained within 60 feet, and well sinking is not usually a very formidable undertaking.

It is gratifying to note that farmers are co-operating in a greater degree with the Department of Agriculture in testing new crops tried with success at the various Experiment Stations. Much interest is evidenced in oil-bearing crops, and there will be a very considerable acreage planted to these, especially to ground-nuts and sunflower. During the past season the two crops which have chiefly demonstrated their value are dhal and Napier's fodder, and there remains no doubt that these are destined to occupy a prominent place in Rhodesian agriculture.

# Veterinary Report.

July, 1914.

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## SALISBURY.

AFRICAN COAST FEVER.—No fresh outbreaks. Eleven cases occurred during the month—six at Epworth, two at M.T.C. farm, and three at Bluff Hill. All the animals were destroyed.

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## BULAWAYO.

AFRICAN COAST FEVER.—No outbreaks or cases.

TUBERCULOSIS.—One animal tested and found healthy.

MALLEIN TEST.—The following animals were tested with mallein and found free from glanders (Gwanda included):—Horses, 192; mules, 30; donkeys, 397.

IMPORTATIONS.—From England: Heifers, 18; bulls, 8. From Union of South Africa: Horses, 192; mules, 30; donkeys, 397; heifers, 888; bulls, 28; ostriches, 20; sheep and goats, 5,465; pigs, 18. From Northern Rhodesia: Oxen, 20.

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## UMTALI.

AFRICAN COAST FEVER.—No cases of this disease occurred during the month.

MALLEIN TEST.—One mule tested and found free from glanders.



## GWELO.

No cases of contagious disease reported.

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## GENERAL.

Fresh cases of trypanosomiasis have occurred in the Lomagundi district. There has been an appreciable decrease in the number of cases of redwater and gall-sickness reported. The condition of cattle throughout the Territory is reported to be from fair to good for this season of the year.

C. R. EDMONDS,

Acting Chief Veterinary Surgeon.

# Veterinary Report.

August, 1914.

## SALISBURY.

AFRICAN COAST FEVER.—No fresh outbreaks. Eight cases occurred during the month—three at Epworth, one at M.T.C. farm and four at Bluff Hill.

An ox strayed into and mixed with the infected cattle at Epworth and was destroyed. This is not altogether an uncommon occurrence, but it points out how careful cattle-owners near infected areas should be, as an average herd finding such a strayed animal would just drive it back to its owner's farm if he was not deterred from doing so.

IMPORTATIONS.—1,546 head of cattle, composed of bulls, cows, heifers, oxen, young stock and calves, imported from Northern Rhodesia in June last, are in quarantine at Sipolilo.

## BULAWAYO.

AFRICAN COAST FEVER.—No outbreaks or cases.

TUBERCULOSIS.—One bull re-tested. No re-action.

SCAB.—One outbreak reported in Belingwe district.

MALLEIN TEST.—The following animals were tested with mallein upon entering this Territory and were found free from glanders (Gwanda included):—Horses, 39; mules, 15; donkeys, 141.

IMPORTATIONS.—From England: 3 bulls. From Union of South Africa: Horses, 39; heifers, 264; mules, 15; bulls, 23; donkeys, 141; pigs, 48; sheep and goats, 3,250. From Northern Rhodesia: Oxen, 20.

## UMTALI.

AFRICAN COAST FEVER.—No cases of this disease occurred during the month at the existing centres of N'Odzi, Mabonda or Penhalonga Valley. At the end of the month two bulls were reported sick on the farm Nooitgedacht, South Melsetter district. Microscopical examination of the blood of these animals revealed the existence of African Coast Fever. This farm is a very great distance from any known centre of the disease, and so far no connection can be established. The Veterinary Surgeon in charge of the outbreak reports that the disease was present on this farm eight years back, and some of the animals that went through the last outbreak are still on the farm. Approximately 100 head of cattle are involved.

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## GWELO.

SCAB.—Three outbreaks of this disease reported.

C. R. EDMONDS,

Acting Chief Veterinary Surgeon.



## Garden Calendar.

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By N. L. KAYE-EDDIE.

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### THE FLOWER GARDEN.

*October.*—All flower seeds, annual and perennial, may be sown as in September. A word or two on open seed beds may not be out of place here. These beds should be prepared in a sheltered position, and the soil should be well and deeply dug. This is more essential than at first thought, as in this state the soil when once watered is more easily kept moist, and is not so liable to cake. The top dressing should be free from all undecayed vegetable matter, and, when sown, the seeds should be covered with a thin dressing of fine light soil, over which a thin covering of grass may be placed to keep off evaporation.

Transplanting from boxes or beds should be done on a dull day or towards evening; the plants should be well watered before being removed, and the roots disturbed as little as possible, care being taken that the latter have their full depth and spread when planting.

*November.*—All seeds may now be planted. Annuals for January flowering should be sown, amongst which the following will be found to do excellently in this country.—Balsam, Calliopsis, Centurias, Chrysanthemum, Dianthus, Eschscholtzia, Marigold, Mignonette, Gallardia, Phlox, Poppy, Nasturtium, Nigella, Verbena, and Zinnia. These are all hardy, and may be sown in the open either in beds or in the position desired for flowering. Advantage should be taken of each shower of rain during this month to keep the soil well worked and loose.

## THE VEGETABLE GARDEN.

*October.*—As in September, nearly all vegetable seeds may be sown. Early potatoes should be earthed up when reaching the height of about eight inches. In planting a small amount of marrow, melon, cucumber, and pumpkin, the writer has found it economical to sow the seed one in a tin and transplant when about four inches high in hills. A few cucumbers planted in this manner yielded nearly 400 a week for about two months. Sweet corn and mealies may also be sown this month.

*November.*—All vegetable seeds may be sown during this month. Tomatoes and early peas and beans should be staked. The soil should be kept loose and free from weeds, which now get troublesome.

Sow pumpkin, mealies, peas, and potatoes.

## Market Reports.

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There is a glut of all lines of produce at Salisbury. Mealies and potatoes at the present time are an absolute drug on the market, but the quality of the latter is generally very poor.

Eggs are very plentiful just now, and prices are cheaper than ever before. A fair amount of local butter is forthcoming, but the quality is not good. There is a brisk demand for trek oxen and breeding stock, but money is very tight, and very little business is doing. There is no demand in Salisbury for mules and donkeys.

There have been several stock sales since our last issue went to press, and at Hartley, on the 27th July, Mr. N. A. Arnold disposed of some 200 head. Cows with calves brought about £8 10s., and medium size trek and slaughter oxen averaged about £7.

There was a large attendance at Messrs. H. K. Pinches and Co.'s sale at the end of July. Slaughter stock realised a good 40s per 100 lbs. Dairy stock and young breeding stock afforded keen competition and realised top prices. Native breeding stock were not in big demand. In all, some 700 head changed hands.

At Plumtree, on the 29th August, Mr. A. G. Hay disposed of nearly 400 head of cattle. Slaughter cattle fetched from 30s. to 35s. per 100 lbs., and there was a fair demand for trek oxen. Good cross-bred heifers were sold at £13 and over, while ordinary cows went at £7 to £8. •



| Article.                          | Johannesburg. | Kimberley. | Bulawayo.      | Salisbury. |
|-----------------------------------|---------------|------------|----------------|------------|
| Barley, 150 lbs.                  | 7/11 8/3      | —          | —              | None.      |
| Beans, 203 lbs.                   | 18/0 32/0     | —          | —              | 16/0 35/0  |
| Boer Meal, unsifted,<br>200 lbs.  | —             | —          | 45/6 46/6      | 45/0       |
| Bran, wheaten, 100 lbs.           | 6/9 7/6       | —          | 13/0 14/0      | 15/0       |
| Flour, 100 lbs.                   | —             | —          | —              | 24/0       |
| „ Colonial, 100 lbs.              | —             | —          | 25/0 27/6      | —          |
| Forage, 100 lbs.                  | 4/9 6/0       | —          | 10/0 11/0      | 10/0       |
| „ Colonial Oat                    | —             | —          | —              | —          |
| Hay                               | Bale. 4d. 9d. | —          | Ton. 60/0 65/0 | Ton. 40/0  |
| Kaffir Corn, 200 lbs.             | 8/0 10/6      | —          | 16/6 17/6      | 13/6 15/0  |
| Manna, 100 lbs.                   | 4/0 4/6       | —          | —              | 3/6        |
| Mealies, S. A. White,<br>203 lbs. | 7/4 8/0       | —          | 13/0 14/0      | 8/6 9/3    |
| Mealies, Yellow, 203 lbs.         | 8/10 9/4      | —          | 13/0 14/0      | None.      |
| Mealie Meal, White,<br>183 lbs.   | —             | —          | —              | 9/6 10/0   |
| Munga, 200 lbs.                   | —             | —          | —              | 13/6 14/0  |
| Monkey Nuts, bag, 83 lbs.         | 9/0           | —          | 10/6 11/6      | 7/6        |
| Oats, 150 lbs.                    | 9/0           | —          | —              | 22/6 25/0  |
| Onions, 120 lbs.                  | 11/0 11/6     | —          | —              | 25/0       |
| Peas, 200 lbs.                    | 18/0          | —          | —              | —          |
| Potatoes, new, 150 lbs.           | 12/0 15/0     | —          | 20/0 22/6      | —          |
| „ old, 150 lbs.                   | 7/0 10/0      | —          | —              | 15/0 17/6  |
| Rapoko                            | —             | —          | —              | 9/0        |
| Rye, 200 lbs.                     | 18/6          | —          | —              | —          |
| Salt, 200 lbs.                    | 3/9 4/0       | —          | 10/0 11/0      | 12/0       |
| Wheat, 203 lbs.                   | 18/0          | —          | —              | —          |
| Butter, local, per lb.            | 1/0 1/3       | —          | 1/6 1/9        | 1/6 2/0    |
| Eggs, local, per dozen            | 7½d. 10½d.    | —          | 1/4 1/8        | 1/6 2/0    |
| Ducks, each                       | 1/8 4/0       | —          | —              | 3/6 4/0    |
| Fowls, each                       | 1/5 3/0       | —          | 1/3 1/8        | 2/6 5/0    |
| Geese, each                       | 2/6 3/9       | —          | —              | 7/6 9/0    |
| Turkeys, cocks, each              | 6/0 13/0      | —          | —              | 12/6 17/0  |

## LIVE STOCK.

|                            |           |   |            |             |
|----------------------------|-----------|---|------------|-------------|
| Slaughter Cattle, 100 lbs. | £7/10 £14 | — | 35/0 37/6  | 40s.        |
| Trek Oxen, trained         | £7 £8     | — | £7/5 £11   | £8 £11      |
| Local Cows, milk           | —         | — | £17/10 £30 | £12 £15     |
| Dairy Cows                 | —         | — | £20 £32    | £20 £30     |
| Native Cows                | —         | — | —          | £6/10 £7/10 |
| Heifers, Colonial          | £4 £6     | — | £8 £17     | —           |
| „ Native                   | —         | — | —          | £3/10 £5    |
| Pigs, live weight          | 2½d. 4d.  | — | 4d. 5d.    | 4d. 4½d.    |
| Horses, riding, salted     | —         | — | —          | £35 £40     |
| „ „ unsalted               | £10 £24   | — | £15 £35    | £20 £30     |
| Mules, inoculated          | —         | — | £30 £40    | £20 £25     |
| Donkeys, geldings          | £4 £6     | — | £5 £7/10   | £5 £6       |
| „ mares                    | —         | — | £7 £8      | £6 £7       |
| Goats                      | 10/6 12/0 | — | 10/0 15/0  | 15/0 17/6   |
| Persian Ewes               | —         | — | 20/0 21/0  | 20/0 21/0   |
| Cross-bred Ewes            | —         | — | —          | 15/0 17/0   |
| Sheep, slaughter (good)    | 15/0 20/0 | — | 23/6 26/0  | 23/6 25/0   |

## Weather Bureau.

## TEMPERATURES.

| STATION                         | JULY         |              | AUGUST       |              |
|---------------------------------|--------------|--------------|--------------|--------------|
|                                 | Mean<br>Max. | Mean<br>Min. | Mean<br>Max. | Mean<br>Min. |
| MASHONALAND—                    |              |              |              |              |
| Hartley, Gatooma ...            | 73·2         | 41·3         | 81·6         | 48·9         |
| „ Giant Mine ...                | 73·4         | 42·6         | 82·2         | 47·9         |
| „ Hallingbury Farm ...          | 67·1         | 38·1         | 73·7         | 46·0         |
| Lomagundi, Eldorado Mine ...    | 78·7         | 44·1         | 83·0         | 49·8         |
| „ Kanyemba ...                  | 82·5         | 55·9         | —            | —            |
| „ Sinoia ...                    | 76·8         | 38·5         | 82·2         | 47·3         |
| „ Sipolilo ...                  | —            | —            | —            | —            |
| Makoni, River Junction ...      | —            | —            | —            | —            |
| Mazoe, Shamva Mine ...          | 70·9         | 44·2         | 79·0         | 51·4         |
| Melsetter ...                   | 63·2         | —            | 67·8         | —            |
| „ Mount Selinda ...             | 66·4         | 46·7         | —            | —            |
| „ Vermont ...                   | —            | —            | —            | —            |
| Salisbury, Chishawasha ...      | 77·1         | 41·7         | 77·3         | 44·6         |
| „ The Gaol... ...               | 70·7         | 41·0         | 76·9         | 46·6         |
| Umtali, Chiconga's Location ... | 69·3         | 44·3         | 74·3         | 49·2         |
| „ Summerfield ...               | 59·9         | 46·1         | 63·5         | 52·2         |
| Victoria ...                    | 67·9         | 41·6         | —            | —            |
| MATABELELAND—                   |              |              |              |              |
| Bulawayo, Essexvale ...         | —            | —            | 74·1         | 46·8         |
| „ Observatory ...               | 68·2         | 43·8         | —            | —            |
| „ Rhodes Matopo Park... ...     | 71·4         | 42·2         | 73·9         | 46·5         |
| Gwelo, The Gaol ...             | 68·6         | —            | 73·9         | —            |
| Mangwe, Empandeni ...           | 72·7         | 57·6         | 74·9         | 59·3         |
| Tuli ...                        | 78·2         | 43·3         | 75·9         | 49·8         |
| Wankie, The Hospital ...        | 82·2         | 51·9         | 86·6         | 57·9         |
| Victoria Falls ...              | 76·9         | 34·2         | 83·1         | 43·7         |

## RAINFALL.

| STATION              | July | August |
|----------------------|------|--------|
| MASHONALAND :        |      |        |
| Charter—             |      |        |
| Buhera ...           | 0·09 | 0·49   |
| Driefontein ...      | 0·15 | —      |
| Enkeldoorn ...       | —    | Nil    |
| Grootfontein ...     | 0·12 | —      |
| Marshbrook ...       | Nil  | Nil    |
| The Range ...        | 0·10 | 0·23   |
| Riversdale ...       | Nil  | —      |
| Umvuma (Railway) ... | Nil  | 0·50   |

## RAINFALL—(Continued).

| STATION                          | July | August |
|----------------------------------|------|--------|
| MASHONALAND—(Continued)          |      |        |
| Hartley—                         |      |        |
| Ardgowan ... ..                  | Nil  | Nil    |
| Battlefields (Railway) ... ..    | Nil  | Nil    |
| Beatrice Mine ... ..             | —    | —      |
| Carnock Farm ... ..              | 0·04 | 0·18   |
| Norton Siding ... ..             | Nil  | Nil    |
| Elvington ... ..                 | Nil  | —      |
| Franceys ... ..                  | 0·02 | 0·24   |
| Gatooma ... ..                   | Nil  | Nil    |
| Gatooma (Railway) ... ..         | Nil  | Nil    |
| Giant Mine ... ..                | Nil  | 0·28   |
| Gowerlands ... ..                | Nil  | 0·06   |
| Hallingbury ... ..               | Nil  | Nil    |
| Hartley (Railway) ... ..         | Nil  | Nil    |
| M'pofha ... ..                   | —    | 0·18   |
| “Jenkinstown” ... ..             | Nil  | —      |
| Makwiro ... ..                   | —    | —      |
| Shagari ... ..                   | Nil  | 0·05   |
| “Stoneygate” ... ..              | Nil  | Nil    |
| Lomagundi—                       |      |        |
| Banket Junction (Railway) ... .. | Nil  | Nil    |
| Darwendale ... ..                | —    | —      |
| Duxbury Farm ... ..              | 0·13 | 0·15   |
| Eldorado Mine ... ..             | 0·08 | Nil    |
| „ (Railway) ... ..               | 0·08 | Nil    |
| Golden Kopje Mine ... ..         | —    | —      |
| Kanyemba ... ..                  | Nil  | —      |
| Longmead ... ..                  | 0·07 | Nil    |
| Palm Tree Farm ... ..            | Nil  | Nil    |
| Sinoia ... ..                    | 0·16 | Nil    |
| Sipolilo ... ..                  | —    | —      |
| Umvukwe Rancho ... ..            | 0·14 | —      |
| Makoni—                          |      |        |
| Chimbi Source ... ..             | 0·53 | 0·26   |
| Eagle's Nest ... ..              | 0·23 | 0·61   |
| Ellavale ... ..                  | 0·40 | 0·05   |
| Inyanga ... ..                   | 0·27 | —      |
| Mona ... ..                      | 0·53 | —      |
| Monte Cassino Mission ... ..     | 0·13 | 0·40   |
| Odzi (Railway) ... ..            | 0·95 | 0·07   |
| River Junction ... ..            | —    | —      |
| Rusape (Railway) ... ..          | 0·70 | Nil    |
| Springs ... ..                   | Nil  | 0·10   |
| St. Trias' Hill ... ..           | 0·91 | 0·26   |
| York Farm ... ..                 | 1·16 | 1·30   |
| Mangwendi—                       |      |        |
| Bonongwe ... ..                  | —    | —      |
| Glen Somerset ... ..             | 0·99 | 0·17   |
| Land Settlement Farm ... ..      | —    | —      |
| Macheke (Railway) ... ..         | Nil  | 0·60   |
| Marandellas ... ..               | —    | —      |



## RAINFALL—(Continued).

| STATION                           | July | August |
|-----------------------------------|------|--------|
| MASHONALAND—(Continued)           |      |        |
| Mangwendi (Continued)             |      |        |
| Marandellas (Railway)             | Nil  | 0.30   |
| Mrewa                             | —    | —      |
| Mungo                             | —    | —      |
| Rusawi Outspan                    | —    | —      |
| Selous Nek                        | 0.10 | —      |
| Tweedjan                          | 0.60 | 0.90   |
| Mazoe—                            |      |        |
| Avonduur                          | —    | —      |
| Bindura                           | —    | —      |
| Bindura (Railway)                 | Nil  | Nil    |
| Ceres                             | 0.08 | —      |
| Chipoli                           | —    | —      |
| Claverhill                        | —    | —      |
| Darwin                            | Nil  | Nil    |
| Dunmaglas                         | —    | —      |
| Laguaha                           | —    | —      |
| Lowdale                           | —    | —      |
| Mazoe                             | —    | —      |
| Mguta Valley                      | Nil  | Nil    |
| Omeath                            | —    | —      |
| Ruia                              | 0.07 | —      |
| Shamva                            | —    | —      |
| „ Mine                            | Nil  | Nil    |
| Sunnyside                         | —    | —      |
| Teign                             | Nil  | —      |
| Umvukwe Flats                     | —    | —      |
| Melsetter—                        |      |        |
| Chikore                           | 1.35 | —      |
| Chipinga                          | 1.37 | 0.56   |
| Helvetia                          | 1.44 | 1.96   |
| Melsetter                         | 3.00 | 0.10   |
| Mount Selinda                     | 2.25 | —      |
| Mutambara Mission                 | —    | —      |
| Pasture                           | Nil  | 0.42   |
| Tom's Hope                        | 0.34 | 1.36   |
| Vermont                           | 1.61 | 1.61   |
| Salisbury—                        |      |        |
| Avondale                          | 0.22 | 0.06   |
| Brookmead                         | 0.18 | 0.39   |
| Chishawasha                       | 0.11 | 0.02   |
| Cleveland Reservoir               | 0.29 | 0.03   |
| Goromonzi                         | —    | —      |
| Gwibi                             | Nil  | —      |
| Lilfordia                         | —    | —      |
| Meadows                           | —    | —      |
| Salisbury Agricultural Laboratory | —    | —      |
| „ (Club)                          | 0.26 | —      |
| „ (Gaol)                          | 0.43 | 0.07   |

RAINFALL (*Continued*).

| STATION                 |     |     |     | July | August |
|-------------------------|-----|-----|-----|------|--------|
| MASHONALAND—(Continued) |     |     |     |      |        |
| Salisbury (Continued)   |     |     |     |      |        |
| Salisbury (Railway)     | ... | ... | ... | 0·35 | 0·08   |
| Sebastopol              | ... | ... | ... | 0·55 | 0·16   |
| Selby                   | ... | ... | ... | —    | —      |
| Westridge               | ... | ... | ... | 0·29 | 0·10   |
| Umtali—                 |     |     |     |      |        |
| Chiconga's Location     | ... | ... | ... | 0·43 | 0·03   |
| Odzani                  | ... | ... | ... | 0·57 | 0·15   |
| Penhalonga              | ... | ... | ... | 0·65 | 1·05   |
| Premier Estate          | ... | ... | ... | —    | —      |
| Public School           | ... | ... | ... | —    | —      |
| Stralsund               | ... | ... | ... | 0·72 | 0·53   |
| Summerfield             | ... | ... | ... | 0·47 | 0·29   |
| Umtali (Railway)        | ... | ... | ... | 0·70 | 0·31   |
| Victoria—               |     |     |     |      |        |
| Chibi                   | ... | ... | ... | —    | —      |
| Chilimanzi              | ... | ... | ... | —    | —      |
| Chingombe               | ... | ... | ... | 0·15 | —      |
| Chiredzi Ranche, Ndanga | ... | ... | ... | 0·28 | 0·35   |
| Clipsham                | ... | ... | ... | 0·21 | 0·21   |
| Gokomere                | ... | ... | ... | 0·33 | 0·39   |
| Gutu                    | ... | ... | ... | 0·15 | 0·39   |
| Hanyanya (Bikita)       | ... | ... | ... | 2·20 | 0·77   |
| Makorsi River Ranche    | ... | ... | ... | 0·24 | 0·05   |
| Marthadale              | ... | ... | ... | 0·55 | 0·50   |
| Morgenster              | ... | ... | ... | 0·79 | 0·27   |
| Noeldale                | ... | ... | ... | 0·15 | 0·25   |
| Pamushana               | ... | ... | ... | 0·89 | 0·25   |
| Silver Oaks             | ... | ... | ... | 0·22 | 0·38   |
| Victoria                | ... | ... | ... | 0·12 | —      |
| MATABELELAND :          |     |     |     |      |        |
| Belingwe—               |     |     |     |      |        |
| Albany                  | ... | ... | ... | Nil  | 0·05   |
| Filabusi                | ... | ... | ... | —    | Nil    |
| Fort Rixon              | ... | ... | ... | —    | —      |
| Infiningwe              | ... | ... | ... | —    | —      |
| Insiza (Railway)        | ... | ... | ... | Nil  | Nil    |
| Shangani (Railway)      | ... | ... | ... | Nil  | Nil    |
| Tamba                   | ... | ... | ... | —    | —      |
| Thornville              | ... | ... | ... | 0·04 | —      |
| Bubi—                   |     |     |     |      |        |
| Inyati                  | ... | ... | ... | Nil  | —      |
| Leighton                | ... | ... | ... | —    | —      |
| Lochard Experiment Farm | ... | ... | ... | 0·04 | 0·10   |
| Bulalima—               |     |     |     |      |        |
| Figtree                 | ... | ... | ... | —    | —      |
| Mholi (late Magot)      | ... | ... | ... | 0·05 | —      |
| Marula                  | ... | ... | ... | —    | —      |
| Solusi                  | ... | ... | ... | Nil  | 0·14   |
| Syringa                 | ... | ... | ... | Nil  | 0·73   |

RAINFALL (*Continued*).

| STATION                         | July | August |
|---------------------------------|------|--------|
| MATABELELAND—(Continued)        |      |        |
| Bulawayo—                       |      |        |
| Balla Balla (Railway) ...       | Nil  | 0·32   |
| Bembesi (Railway) ...           | Nil  | 0·08   |
| Braemar ...                     |      |        |
| Essexvale ...                   | Nil  | 0·24   |
| Gwaai (Railway) ...             | Nil  | Nil    |
| Heany Junction (Railway) ...    | Nil  | 0·13   |
| Hope Fountain ...               | 0·03 | 0·27   |
| Imbesu Kraal ...                | —    | —      |
| Keendale ...                    | Nil  | 0·33   |
| Khami ...                       | Nil  | 0·11   |
| Lower Rangemore ...             | Nil  | 0·10   |
| Matopo Mission ...              | —    | —      |
| Maxim Hill ...                  | —    | —      |
| Melinakanda Junction ...        | —    | —      |
| Nyamandhlovu (Railway) ...      | Nil  | Nil    |
| Observatory ...                 | Nil  | —      |
| Pendennis ...                   |      |        |
| Raylton ...                     | —    | —      |
| Rhodes Matopo Park ...          | 0·03 | 0·17   |
| Umgusa ...                      |      |        |
| Umkien ...                      | —    | —      |
| Gwanda—                         |      |        |
| Antelope Mine ...               | Nil  | 0·76   |
| Gwanda (Gaol) ...               | 0·05 | 0·63   |
| „ (Railway) ...                 | Nil  | 0·58   |
| Malundi ...                     | 0·06 | 0·97   |
| Mtshabzi Mission ...            | 0·03 | 0·24   |
| West Nicholson (Railway) ...    | Nil  | 0·36   |
| Gwelo—                          |      |        |
| Globe and Phoenix (Railway) ... | Nil  | Nil    |
| Gwelo (Gaol) ...                | 0·11 | 0·22   |
| Gwelo (Railway) ...             | 0·09 | 0·21   |
| Lalapanzi ...                   | 0·13 | 0·76   |
| Lochiel ...                     | —    | 0·77   |
| Lower Gwelo ...                 |      |        |
| Que Que ...                     |      |        |
| Rhodesdale Estate ...           | Nil  | —      |
| Selukwe (Railway) ...           | 0·28 | 0·10   |
| Shawlands ...                   | —    | —      |
| Sheltered Vale ...              | —    | 0·37   |
| Sikombela ...                   | Nil  | —      |
| Mafungabusi—                    |      |        |
| Inyoka ...                      |      |        |
| Mangwe—                         |      |        |
| Empandeni ...                   | Nil  | 1·32   |
| Garth ...                       | 0·08 | 0·94   |



RAINFALL (*Continued*)

| STATION                  |     |     |     | July | August |
|--------------------------|-----|-----|-----|------|--------|
| MATABELELAND—(Continued) |     |     |     |      |        |
| Tuli—                    |     |     |     |      |        |
| Lamulas                  | ... | ... | ... | Nil  | —      |
| Langalanga               | ... | ... | ... | Nil  | —      |
| Makalali                 | ... | ... | ... | Nil  | —      |
| Manantji                 | ... | ... | ... | Nil  | —      |
| Manyoni                  | ... | ... | ... | Nil  | —      |
| Mazunga                  | ... | ... | ... | Nil  | 0·57   |
| Tuli                     | ... | ... | ... | Nil  | 0·34   |
| Wankies—                 |     |     |     |      |        |
| Malindi (Railway)        | ... | ... | ... | Nil  | Nil    |
| Victoria Falls           | ... | ... | ... | Nil  | Nil    |
| Victoria Falls (Railway) | ... | ... | ... | Nil  | 0·02   |
| Wankies Hospital         | ... | ... | ... | Nil  | 0·02   |
| Wankies (Railway)        | ... | ... | ... | Nil  | Nil    |

— No return.

# Dates of Meetings of Farmers' Associations, Southern Rhodesia

(SUBJECT TO ALTERATION)

| Name of Association                   | Place of Meeting                  | Secretary            | 1914    |                |          |
|---------------------------------------|-----------------------------------|----------------------|---------|----------------|----------|
|                                       |                                   |                      | October | November       | December |
| Bindura                               | Bindura                           | A. M. Robb           |         |                |          |
| Charter-Mgezi                         | Beatrice Mine                     | W. Krienke           |         |                | 25       |
| Central                               | Unvuma                            | N. Dainty            | 30      | 27             |          |
| Enterprise                            | Arcturus Hotel                    | J. F. Pilgrim        | 13      | 10             | 8        |
| Felixburg                             | Unvuma                            | E. C. Boardman       | 31      | 28             | 26       |
| Figtree Branch, R.L. and F.A.         | Figtree Station                   | A. Curtis            | 17      | 7              |          |
| Gatooma                               | Gatooma                           |                      |         | 21             | 19       |
| Gazaland                              | Chipinga                          | W. Wood              | 29      |                |          |
| Greystone                             | Roodheuevel, Shangani             | J. W. Spencer        | 10      | 14             | 12       |
| Hartley                               | Hartley                           | H. Savory            | 10      | 7              | 5        |
| Headlands                             | Headlands                         | H. Barnes Pope       |         |                |          |
| Hunter's Road Farmers and Stockowners | Hunter's Road Siding              | R. W. Twilley        | 10      | 14             | 12       |
| Insiza                                | Insiza Station Hotel              | N. C. St. J. Breslin |         | 14             |          |
| Iron Mine Hill Proper                 | Iron Mine Hill                    | T. Irving            | 10      | 7              | 12       |
| Lalapanzi and Iron Mine Hill          | Lalapanzi and Iron Mine Hill alt. | Cyril Allen          | 16      | 20             | 18       |
| Lomagundi                             | Sinoia                            | W. Abbott            | 17      | 21             |          |
| Macheke                               | Macheke                           | H. H. Kidson         |         | 7              |          |
| Makwiro                               | Makwiro                           | F. R. McLellan       | 16      | 20             | 18       |
| Marandellas                           | Marandellas Farmers' Hall         | E. P. de Kock        | 3       | 7              | 5        |
| Mangwendi                             | Fixed every meeting               | Luke Green           | 7       | 7              | 5        |
| Makoni                                | Rusape                            | J. A. Tapson         | 3       | 7              | 5        |
| Marula                                | Marula Siding                     | Mac. W. Ingram       | 24      | 28             | 26       |
| Mashonaland                           | Commercial Hotel, Salisbury       | W. H. Williamson     | 10      | 14             | 12       |
| Matopo Branch, R.L. and F.A.          | Malindi Hotel                     | W. Bathurst          |         | 11             |          |
| Mazoe                                 | Glendale Siding                   | R. Newell            | 14      | 11             | 9        |
| Melsetter (North)                     | Various farms                     | Rev. R. Woodhouse    |         |                | 5        |
| Midlands                              | Gwelo                             | Box 23, Gwelo        | 10      | 14             | 12       |
| Northern                              | Farm "Summerfield"                | R. V. H. Blurton     | 3       |                |          |
| Plumtree                              | Plumtree                          | E. F. Wilmore        | 10      | 14             | 12       |
| Que Que                               | Globe and Phoenix Hotel           | E. E. Somerset       | 17      | 21             | 19       |
| Rhodesian Landowners and Farmers      | Library Buildings, Bulawayo       | H. S. Hopkins        | 30      | 27             | 25       |
| Shamva                                | Shamva                            | J. M. Mounray        |         | No dates fixed |          |
| Southern                              | Peggy Hotel, Insiza               | W. J. B. Harris      | 4       | 1              | 6        |
| Selukwe                               | Selukwe                           | F. S. Clark          |         | No dates fixed |          |
| Somabula and Shangani Plains          | Fairview                          | G. B. Botha          |         |                |          |
| Unvukwe                               | Birkdale Ranch                    | Hon. J. S. Parker    | 3       |                | 5        |
| Untali                                | Christmas Pass Hotel              | J. S. Holland        | 3       | 7              |          |
| Victoria                              | Victoria                          | H. S. Hoatson        | 21      | 18             | 16       |
| Vungu                                 | Vungu                             | J. H. Erasmus        | 8       |                | 10       |
| West Gwelo                            | Somabula                          | A. P. Shone          | 10      |                |          |

## Rhodesia and the War.

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The following circular, issued by the Acting President of the Rhodesia Agricultural Union, is published for general information:—

The Executive of the Rhodesia Agricultural Union, at a meeting held shortly after the outbreak of war, conveyed to His Majesty's Government an expression of sincerest loyalty, and subsequently, in response to an enquiry, the Imperial Government signified its grateful thanks and willingness to accept a donation of maize from the agriculturists of Rhodesia. The question of the best means by which the collecting and forwarding should be carried out has been carefully considered, and it has been decided:—

(1) Every President of a Farmers' Association be asked to organise the collection of maize in his particular district, and that the opportunity for contributing be given to everyone in his area.

(2) A date to be fixed when all contributions of maize shall be collected at the most convenient railway stations and sidings.

(3) In some districts it is well known there is no maize, but this need debar no one, as it is suggested that donations of stock or cash be made, and as regards stock these be sold locally.

(4) Ten days prior to the date agreed upon for the disposal of the maize at the railway, the Secretary of the Rhodesia Agricultural Union to be informed; he will then advise the stations as to the forwarding of the grain.

(5) All cash collected or moneys realised by the sale of stock to be sent to the Secretary of the Union, who will purchase maize to the value of the money received.



(6) The Farmers' Co-operative Society at Salisbury have offered every facility, and are assisting in the work; they will undertake to concentrate all the maize at Salisbury and Umtali. When the whole collection is complete, the maize will be forwarded in one donation by the Co-operative Society, who will arrange for delivery to the Imperial Government. In order to save railage, small parcels collected at stations, instead of being sent to Salisbury, may be forwarded to some nearer point, and the equivalent be taken from stocks at Salisbury or Umtali.

(7) Contributions will be gratefully accepted from people other than farmers. If in maize or stock, it is requested that the donation be handed over to the President of the local Association; if in cash, the amount can either be handed over to the President of the Association or direct to the Secretary of the Rhodesia Agricultural Union.

In placing this before the public and the farmers of Rhodesia, it is not necessary to say much in the way of appeal. Many will consider it a privilege to contribute. All must consider it a duty to help in some way. Our security depends on the stability of the Mother Country, and as help is flowing in from every other part of the Empire, so it is from Rhodesia. Rhodesia may not be rich in wealth or population, but she is rich in great hearts and willing hands.

## Departmental Notices.

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### Information for Farmers

The Department of Agriculture is prepared to furnish to farmers technical advice either by correspondence, or, where possible, by personal visits. All communications should be addressed in the first instance to the Director of Agriculture.

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### Crops

The Agricultural Branch deals with enquiries relating to agricultural practice, soils, crops, cultural operations, processes, seeds, trees, farm implements and machinery, etc.

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### Disposal of Pure Seed.

Farmers devoting special attention to the production of pure seed of any locally grown crops are invited to communicate with the Government Agriculturist, and at the same time to submit a  $\frac{1}{4}$  lb. sample of any seed which they may have for disposal.

In addition to indicating the total amount of seed offered and the price f.o.r. the nearest railway station or siding, the correct name of the variety and the origin of the seed from which the crop was grown should be given. In the case of special attention having been devoted to seed selection, the methods employed should be described.

Where these stipulations are complied with, and the samples forwarded are deemed by the Agriculturist of sufficiently high quality for seed purposes, growers and intending purchasers will be put in touch with one another. It is hoped by this means to encourage the production of pure seed, and growers are urged whenever possible to sell their seed under guarantee of trueness to name, type and sample deposited with the Department.

After placing growers and would-be purchasers in touch with one another, the Department can accept no further responsibility except in the position of adjudicator when bulk

supplies are thought inferior to sample and description, in which case both parties will be required to abide by the decision of the Department.

For further particulars see article on Pure Seed Supply, *Rhodesia Agricultural Journal*, February, 1914.

## Farm Seeds

The undermentioned seeds grown on the Government Experiment Farms are now available for sale at the prices stated. Those in Section A have been grown in Mashonaland, and the prices are f.o.r. Salisbury. Those in Section B are the produce of the Matabeleland Experiment Farm, and will be delivered f.o.r. Bembesi.

*All orders for seed must be addressed in the first instance to the Government Agriculturist, Department of Agriculture, Salisbury.*

Section A.—(1) Specially selected seed maize, Salisbury White, Hickory King 10 row and Hickory King 8 row, 15s. per 100 lbs.

(2) Selected seed maize of the above varieties, 12s. 6d per 100 lbs.

(3) Seed grain on the ear, of the above varieties, in lots not exceeding 50 ears to any one applicant, price 10s. per lot.

*The above shelled seed has all been carefully selected, tipped, butted and hand-shelled. Supplies are limited, and in order to meet the large demand, not more than one to two bags can be supplied to each applicant.*

(4) Japanese and silver-hulled buckwheat, 10s. per 100 lbs.

(5) German millet and Dhal, 3d. per lb.

(6) Striped Russian and black sunflower seed, 2d. per lb.

(7) Victoria and Le Roux wheat (summer), 15s. per 100 lbs.

(8) White flowering and large seeded linseed, 4d. per lb.

(9) Spanish ground-nuts and New Era cow-peas, 20s. per 100 lbs.



- Section B.*—(1) Japanese buckwheat, 10s. per 100 lbs.  
 (2) German and Japanese millet and Dhal, 3d. per lb.  
 (3) Teff grass seed, 6d. per lb.  
 (4) Sapling kafir corn, 15s. per 100 lbs.  
 (5) New Era and Natal black cow-pea, 20s. per 100 lbs.

### Co-operative Seed Distribution.

The following seeds of summer crops are offered f.o.r. Salisbury for trial under the usual terms of co-operative experiments. The experimenter is required at the close of the season to forward to the Agricultural Department, on forms supplied for that purpose, an accurate report of the result of his experiments.

Seed is supplied in sufficient quantity to sow from  $\frac{1}{4}$  to 1 acre according to variety, and not more than four varieties can be sent to any one applicant. All applications, together with full particulars regarding forwarding, should be addressed to the Government Agriculturist, Department of Agriculture, Salisbury.

1. *Maize.*—Iowa Silver Mine White, Chester County Yellow. Early, drought resisting varieties. *offered for trial in Matabeleland only.*

2. *Summer Cereals.*—Victoria Wheat and other varieties of summer wheat, Nepal Barley, Burt, Smyrna and New Zealand Oats, and improved varieties of Rice.

3. *Oil Seeds.*—Linseed, Castor Oil, annual and perennial. Sunflower, striped and black Russian, and Ground-nut varieties.

4. *Leguminous Crops.*—Cowpeas, Velvet Beans and Dhal.

5. *Hay Crops.*—German Millet, Japanese Millet and Teff Grass.

6. *Root Crops.*—Mangel, Sugar Beet, Carrots and Cattle Radish.

7. *Fibre Crops.*—Hemp, Jute, Mauritius Hemp, Ramie and Sunn Hemp.

8. *Miscellaneous Crops*.—Japanese and Silver hulled Buckwheat, Majorta Melon, New Zealand Spinach (vegetable), Rape and Cattle Kale.

9. *Pasture Plants and Grasses*.—Napier's Fodder slips, Paspalum, Sheep's Burnet, Tall Fescue and Beggar Weed (legume).

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### Poisonous Plants

It is of great importance that as soon as possible a study should be made of those plants found in Southern Rhodesia which are poisonous or deleterious to small or large stock. Farmers and others who have known, or suspected poisonous plants on their property, are requested to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, at the same time forwarding specimens of the plant, including stem, leaves, flowers, and, where possible, fruit. Any particular regarding the habits of the plant will be welcomed, and in return the Department will supply all available information regarding the plants.

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### Tobacco

The services of the Tobacco Expert are available to all desiring advice on the subject. Applications should be accompanied by particulars of the nature of the information sought, also the distance and direction of the farm from some well known centre.

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### Live Stock

The Animal Industry Branch is prepared to advise with regard to all matters connected with stock breeding, selection, feeding and registration of stud animals, the dairy industry, poultry management, farm buildings for stock, and kindred subjects. Buyers and sellers of stud stock in Rhodesia are also put in touch with one another.

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### Entomology

The Government Entomologist advises on matters connected with insect pests of live stock, crops, and fruit trees, and also undertakes the inspection of nurseries and of the importation of plants from abroad.

## Chemical Analyses

The Government Agricultural Chemist deals with matters relating to the composition of soils, fertilisers, farm produce of vegetable or animal origin; also the investigation of poisons and of articles of potential economic value.

Nominal charges are made, which, while not covering the cost, will help to defray the expense and serve as a proof of good faith. Samples, carriage prepaid, together with full particulars regarding the subject should be addressed to the Agricultural Chemist, Department of Agriculture, Salisbury.

A schedule of charges and directions for taking samples will be furnished on application.

With all analyses, reports will be furnished explanatory of the results and, when possible, advice given as to the nature, properties and value of the material.

No charge will be made for analysis where the material forwarded is considered by the Director of Agriculture and Chemist to be of sufficient general interest.

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## Services of Government Veterinary Surgeons

1. The services of Government Veterinary Surgeons are available to the public, free of charge, for the following purposes only :—

- (1) Attending and giving professional advice in connection with the following diseases, viz. :—Anthrax, Contagious abortion, East Coast Fever, Epizootic Lymphangitis, Foot and Mouth Disease, Farcy, Foot-rot, Heartwater, Glanders, Intestinal parasites amongst sheep and goats, Liver Disease, Lungsickness, Osteo Porosis, Malarial Catarrhal Fever (blue tongue), Rabies, Redwater, Rinderpest, Scabies, Sponziekte (quarter evil), Swine Fever, and any other diseases which may in future be scheduled in terms of section 3, sub-section 18 of the "Animals Diseases Consolidation Ordinance, 1906." Attending to cases of disease amongst live stock which, though not of a contagious or infectious character, may be of general public importance.



(2) Applying tests in regard to Glanders, Tuberculosis, or any other disease against the introduction or spread of which tests are applied under regulations.

(3) Inoculations against the following diseases :—

Horsesickness, Lungsickness, Anthrax, Quarter Evil, Redwater, Malarial Catarrhal Fever (blue tongue). A fee to cover the cost of serum and virus will be charged.

2. The following charges shall be made and payable for services rendered by the Government Veterinary Surgeons in other cases, viz. :—

|   | £ | s. | d. |
|---|---|----|----|
| (1) For every professional visit within three miles of his office or residence ... ..                 | 0 | 5  | 0  |
| (2) For every professional visit beyond such distance ... ..  | 0 | 10 | 6  |
| plus an additional charge of 2/6 per hour whilst engaged in such visits or £2/2/0 a day of 24 hours ; |   |    |    |
| (3) For advice given at the Veterinary Surgeon's office, for each animal, per visit                   | 0 | 2  | 6  |
| (4) The following to be charged in addition to visiting fees :—                                       |   |    |    |
| a. For every examination as to soundness, each ... ..   | 1 | 1  | 0  |
| b. For castration, horses, each ... ..  | 1 | 1  | 0  |
| c. For castration, bulls, each ....   | 0 | 5  | 0  |
| d. For castration, donkeys, each.. ...  | 0 | 10 | 6  |
| e. For parturition cases, mares, each   | 2 | 2  | 0  |
| f. For parturition cases, cows, each..  | 1 | 1  | 0  |
| g. For other operations, according to nature, from 5/- to £2/2/0.                                     |   |    |    |

3. Double the above fees will be payable for services rendered on Sundays, public holidays, and between the hours of 7 p.m. and 7 a.m.

4. Applicants for the services of Government Veterinary Surgeons must at their own cost provide the necessary transport for the conveyance of these officers from, and back to, their residence or nearest railway station.

5. Farmers and owners of stock throughout the country frequently telegraph for a Government Veterinary Surgeon to

be sent to attend an animal which has been taken seriously ill. It is rarely possible to comply with these requests at once, as the Veterinary Surgeon may be engaged on duty which he cannot leave, or is at such a distance from where his services are required that he can hardly be expected to arrive in time to be of any service in an urgent case. Hence much valuable time is wasted, the owner of the animal is dissatisfied, and the veterinary staff discredited. To obviate this, in all cases where veterinary advice and assistance are required, the owner should telegraph to "Veteran," Salisbury, with prepaid reply, the nature of the complaint that the animal is suffering from, giving as full and accurate a description of the symptoms as possible. This will enable the Chief Veterinary Surgeon to telegraph advice at once and state whether he is able to arrange for veterinary attendance on the case or not, and save valuable time, which is always of importance in acute cases.

6. The services of Government Veterinary Surgeons will only be available for private work with the consent of such officers, and when such work does not interfere with their official duties, or when the services of a private practitioner are not available.

7. As the arrangement of allowing Government Veterinary Surgeons to attend to private cases is intended purely for the benefit of farmers and stock-owners who may wish to obtain professional advice, no responsibility whatever will be accepted for any loss of stock, etc., which may result from the negligent treatment or advice, or wilful default, of any Government Veterinary Surgeon.

8. All fees collected in terms of these Regulations are payable to the Treasury through the local Receiver of Revenue.

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## Irrigation

From the Agricultural Engineer assistance may be obtained by farmers for the following :—

1. In the locating of possible irrigation projects.
2. In the preparation of surveys or plans and for irrigation works, including weirs, dams, furrows, pumping plants, and determining the extent of land which

may be brought under irrigation schemes, together with rough estimates of costs.

3. In the supervision of construction and carrying out of projects.
4. In the selection of suitable sites for boring operations.
5. Preparing specifications, etc., regarding pumping plants, windmills, and agricultural machinery.
6. Giving general advice on cognate subjects.

Informal advice of a general character will be given to applicants making enquiry by letter or in person. Any applicant desiring professional assistance likely to occupy more than one day should apply for advice in writing. All applicants should specify clearly the nature of the project on which they seek advice, and should give full particulars as to the distance and direction of their farms from some well-known centre. Applicants will be required to provide suitable means of transport for the officer concerned during the period devoted to work on the spot; to provide any unskilled labour that may be required; and to provide for any other contingent services. Applications should be addressed to the Director of Agriculture, who will endeavour to arrange visits as far as possible in order of application, but with due regard to situation, in order to obviate unnecessary travelling and delay. The services of the Agricultural Engineer are given free, but in cases demanding prolonged individual attention, or repeated supervision, a charge may be made according to circumstances.

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## Samples

In connection with enquiries, especially with regard to diseases amongst crops, insect pests, soils, grain and the identification of plants, specimens should, wherever possible, be sent, together with full details. It is found that such parcels are often forwarded without any indication of where they are from or why they were sent and it is difficult in such cases to trace the sender. It is, therefore, requested that persons when forwarding samples for examination, indicate clearly their names and address on the package, so as to enable their requirements to be attended to without delay.



## Charges for Dipping Cattle at Government Dipping Tanks.

A charge of 1d. per head is made in respect of all cattle dipped at Government dipping tanks.

Unweaned calves will be dipped free of charge.

Payment may be made in cash or by means of books of coupons at £1, 10/- and 2/6, which can be obtained from Civil Commissioners, Native Commissioners, or through all Veterinary Surgeons and Cattle Inspectors.

The tanks to which these provisions at present apply are the following :—

Salisbury (3), Bulawayo (3), Inyati, Umtali, Penhalonga, Melsetter, Marandellas, Macheke, Mazoe, Lomagundi, Hartley, Gwelo, Selukwe, Enkeldoorn, Victoria, Gwanda, Gatooma, Que Que, Umvuma, Kimberley Reefs.

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## Lectures for Farmers

The services of certain of the officers of the Department of Agriculture and the Veterinary Department are available for purposes of delivering lectures on subjects upon which they have special knowledge. As far as practicable, lectures will be accompanied by demonstrations at the time or subsequently in the field. Owing to the many calls on the time of the staff and the exigencies of their duties, alternative dates are desirable in order to avoid disappointment. The following topics are offered as examples of subjects that may be dealt with in this manner, but the suggestion of other themes is invited.

*Agriculture.*—Maize growing; Maize selection and maintenance of the breeding plot; Points of maize and maize judging, with demonstrations; Utilisation of granite vlei soils; Ground nut culture; Rotation crops for home use and for sale; Veld improvement by winter grasses; Production of foodstuffs for the mines; Ensilage; Fungoid diseases of maize and wheat; Wheat, oats and lucerne under irrigation; The prospects of cotton culture in Southern Rhodesia.

*Veterinary Hygiene.*—Detection and prevention of disease; The care of live stock.

*Live Stock.*—Judging of cattle according to breeds, and for beef, milk and draught; feeding and kraaling of live stock; general principles of cattle breeding; management of imported stock; grading up of native or local stock with pure bred bulls.

*Dairying.*—Home butter-making; building and equipment of a farm dairy; handling and marketing of milk; packing and marketing of butter; construction of cow houses.

*Swine Husbandry.*—Breeding and feeding of swine; some suggestions for the production of first-class bacon pigs; construction of piggeries at moderate cost.

*Chemistry.*—The principles of soil fertility; the principles of manuring; the value of lime in agriculture; chemistry of milk and its products (accompanied by demonstrations in milk-testing).

*Entomology.*—Economic entomology on the farm; the role of insects and their allies in the transmission of disease; scale insects and fruit trees and methods for their control; insect pests and maize; enemies of the potato, insect and fungus; the value and objects of plant import and nursery regulations.

*Irrigation.*—Methods of applying water to land for irrigation; the measurement of water in connection with irrigation; canal irrigation; storage reservoirs: hints on the selection of sites and on the design of earthen and other dams; irrigation by pumping, with notes on the selection of plants.

Enquiries and invitations should in the first instance be addressed to the Director of Agriculture, Salisbury.

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### Forestry—Sale of Trees

The undermentioned varieties of trees will be available for sale as from December and onwards:—

Casuarina leptoclada—Beefwood.

Cedrela toona—Indian toona.

Callitris calcarata—Cypress pine.

Callitris robusta—Murray pine.

- Cupressus arizonica*—Arizona cypress.  
 do. *horizontalis*—Common cypress.  
 do. *pyramidalis*—Common pyramidal cypress.  
 do. *lusitanica*—Portuguese cypress.  
 do. *torulosa*—Himalayan cypress.

*Dalbergia sissoo*—Indian sissoo.

- Eucalyptus amygdalina*—Peppermint gum.  
 do. *botryoides*—Bastard mahogany gum.  
 do. *calophylla*—Calophylla gum.  
 do. *citriodora*—Lemon-scented gum.  
 do. *corynocalyx*—Sugar gum.  
 do. *longifolia*—Woolly butt gum.  
 do. *microtheca*—Coolibah gum.  
 do. *microcorys*—Tallow wood gum.  
 do. *paniculata*—Red ironbark gum.  
 do. *resinifera*—Red mahogany gum.  
 do. *robusta*—Swamp mahogany.  
 do. *rostrata*—Rostrata gum.  
 do. *saligna*—Saligna gum.  
 do. *tereticornis*—Red gum.  
 do. *siderophloia*—Broad leaved ironbark.  
 do. *sieberiana*—Mountain ash gum.

*Grevillea robusta*—Silk oak.

*Jacaranda mimosæfolia*—Jacaranda.

*Pinus densiflora*—Akamatsu pine.

do. *halepensis*—Aleppo pine.

do. *longifolia*—Cheer pine.

*Thuja orientalis*—Arbor vitæ.

do. *gigantea*—Large arbor vitæ.

Prices are as follows:—

Orders up to 1,000, at 8s. 4d. per 100, tins included.

Orders from 1,000 to 5,000, at 6s. per 100, tins to be provided or returned.

Orders of over 5,000, at 5s. per 100, tins to be provided or returned.

All prices are f.o.r. Salisbury, and trees are in tins weighing about 25lbs. each. There are also a limited number of larger trees, 4 in a tin, at 3d. per tree. Ornamental shrubs, 6d. and 1s. each, generally 4 in a tin. *Dalbergia*



sissoo seed at 6d. per oz. Foureroya gigantea (Mauritius hemp) bulbels, at 1s. per 100; Sisal hemp bulbels, at 3s. per 100; Paspalum, 5s. per 1,000.

Applications, together with remittance and full particulars regarding forwarding, should be addressed to the Forestry Adviser, Department of Agriculture, Salisbury.

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The Forestry Branch gives advice and supplies information on all matters connected with forestry. All enquiries should be directed to the Forestry Adviser, Department of Agriculture, Salisbury.

## Departmental Bulletins

The following Bulletins, consisting of reprints of articles which have appeared in this Journal, are available for distribution free of charge to applicants in Rhodesia :—

### AGRICULTURE.

- No. 2. The Possibilities of Rhodesia as a Citrus Growing Country, by R. McIlwaine, M.A., LL.B.
- No. 61. Requirements in sending Botanical Specimens to the Department for Identification.
- No. 62. Services of Agricultural Engineer.
- No. 64. Hints on Irrigation—Small Gravitation Schemes, by W. M. Watt.
- No. 81. Possibilities of Export Trade in Oil Seeds, by H. Godfrey Mundy, F.L.S.
- No. 90. Reports on Experiments—Experimental Station, Salisbury, 1910-1911, by J. H. Hampton.
- No. 94. Second Report on Experiments, by J. H. Hampton.
- No. 125. Subterranean Water, by W. M. Watt.
- No. 137. Drainage for Irrigated and Swampy Land, by W. M. Watt.
- No. 153. Citrus Fruit Trees—From Seed to Grove.
- No. 155. The Manuring of Maize on the Government Experimental Farm, Gwebi, 1912-13.
- No. 156. Elephant Grass or Napier's Fodder, by J. A. T. Walters, B.A.
- No. 160. Hints on Irrigation—Pumping Plants, by W. M. Watt, Agricultural Engineer.
- No. 164. Citrus Fruits in Rhodesia—Suggestions as to where to Plant, by C. E. Farmer.
- No. 166. Rhodesian Citrus Fruits—Exportation to London.
- No. 173. Citrus Fruits: Cultivation and Pruning, by C. E. Farmer.
- No. 177. Notes on the Raising of Seedling Trees, by F. B. Willoughby.
- No. 182. Some Citrus Growing Experiences in Rhodesia, by R. McIlwaine, M.A., LL.B.
- No. 185. Citrus Fruits—The Preparation of Oranges for Market, by C. E. Farmer.
- No. 189. The Manuring of Maize on the Government Experiment Farm, Gwebi, by G. N. Blackshaw, B.Sc., F.C.S.
- No. —. Orange and Lemon Growing in Southern Rhodesia, by R. McIlwaine.
- Tree Culture in Southern Rhodesia, by P. B. S. Wrey, A.M.I.C.E.

### CROPS.

- No. 88. Chicory Growing, by H. Godfrey Mundy, F.L.S.
- No. 106. Cultivation and Preparation of Ginger.
- No. 107. The Cowpea, by R. H. B. Dickson.
- No. 126. Turkish Tobacco.
- No. 128. Paspalum, by J. A. T. Walters, B.A., Assistant Agriculturist and Botanist.
- No. 132. Sumatra Tobacco, Hints to Rhodesian Growers, by C. J. Sketchley.
- No. 133. Tobacco Culture (Virginia)—Planting, Cultivation, Fertilising, Priming, Topping, Suckering, Ripening.

- No. 138. Tobacco Culture (Virginia)—Harvesting and Curing.  
 No. 162. Rhodesian Maize: The Principal Types and their Points, by J. A. T. Walters, B.A.; Assistant Agriculturist.  
 No. 170. Production of Pedigree Seed—Maize, by H. Godfrey Mundy, F.L.S.  
 No. 174. Notes on Hop Growing, by H. Godfrey Mundy, F.L.S.  
 No. 175. Notes on Lucerne, by H. Godfrey Mundy, F.L.S.  
 No. 176. The Cultivation of Castor Oil Beans, by H. Godfrey Mundy, F.L.S.  
 No. 179. Buckwheat, by H. G. Mundy, F.L.S.  
 No. 181. Sunflower Cultivation, by H. G. Mundy, F.L.S.  
 No. 188. The Ground-Nut or Monkey Nut, by H. Godfrey Mundy, F.L.S.

## ENTOMOLOGY AND VEGETABLE PATHOLOGY.

- No. 58. Onion Thrips, by R. W. Jack, F.E.S.  
 No. 75. Fumigation of Fruit Trees with Hydrocyanic Acid Gas, by R. W. Jack, F.E.S.  
 No. 100. Tsetse—Preliminary Notes on the Habits of—by R. W. Jack, F.E.S.  
 No. 139. Termites, or "White Ants," by Rupert W. Jack, F.E.S.  
 No. 140. Insect Pests of Tobacco in Southern Rhodesia, by R. W. Jack, F.E.S.  
 No. 142. The Bean Stem Maggot, by R. W. Jack, F.E.S.  
 No. 147. Root Gallworm, by R. W. Jack, F.E.S.  
 No. 148. Darkling Beetle Grubs Injurious to Tobacco, by R. W. Jack, F.E.S.  
 No. 151. Potato Spraying Experiments for the Control of Early Blight, by Rupert W. Jack, F.E.S.  
 No. 154. Borers in Native Timber—Results of Experiments with Preservatives, by Rupert W. Jack, F.E.S.  
 No. 158. Two Ladybirds Injurious to Potato Plants, by R. W. Jack, F.E.S.  
 No. 171. The Cabbage Web-Worm—A Pest of Cabbage and Allied Plants, by R. W. Jack, F.E.S.  
 No. 172. Diseases of the Potato Tuber and the Selection of Sound Seed, by R. W. Jack, F.E.S.  
 No. 187. The Dusty Surface Beetle, by Rupert W. Jack, F.E.S.

## VETERINARY.

- No. 50. Epizootic Abortion in Cattle, by Ll. E. W. Bevan, M.R.C.V.S.  
 No. 51. Strangles, by F. D. Ferguson, M.R.C.V.S.  
 No. 53. Animals Diseases Consolidation Ordinance, 1904.  
 No. 77. Animals Diseases Amending Ordinance, 1911.  
 No. 80. Detection and Prevention of Diseases of Stock, by Ll. E. W. Bevan, M.R.C.V.S.  
 No. 84. African Coast Fever—Diagnosis of Gland Puncture, by Ll. E. W. Bevan, M.R.C.V.S.  
 No. 95. Oestrus-ovis in Sheep, by Alec King.  
 No. 103. Dipping and Tick-Destroying Agents, by Lt.-Col. H. Watkins-Pitchford.  
 No. 121. Rabies, by Ll. E. W. Bevan, M.R.C.V.S., and T. G. Millington, M.R.C.V.S., D.V.H.  
 No. 180. Note on the Treatment of Biliary Fever of the Horse with Trypan Blue, by Ll. E. W. Bevan, M.R.C.V.S.  
 Conditions under which Government Veterinary Surgeons' Services are available to the public.



## LIVE STOCK.

- No. 96. Swine Breeds and Breeding of, by Loudon M. Douglas, F.R.S.E.
- No. 105. Bacon Curing on the Farm, by Loudon M. Douglas, F.R.S.E.
- No. 123. Feeding and Care of Imported Bulls, by R. C. Simmons.
- No. 145. Prospects for Importation of Cattle from Australia, by Eric A. Nobbs, Ph.D., B.Sc.
- No. 161. Notes on Cattle Breeding, Part III., by R. C. Simmons.
- No. 163. Feeding and Care of Imported Cattle, by R. C. Simmons.
- No. 167. The Construction of Dipping Tanks for Cattle.
- No. 169. The Breeding and Feeding of Pigs for Bacon Factory Purposes, by R. C. Simmons.

## MISCELLANEOUS.

- No. 93. Formation of Agricultural Credit Associations in Rhodesia, by Loudon M. Douglas, F.R.S.E.
- No. 119. Some Notes on Charcoal Burning, by Eric A. Nobbs, Ph.D., B.Sc.
- No. 127. Notes on the Building of Farm Homesteads, by R. C. Simmons.
- No. 129. How to Make Use of the "Fencing Ordinance, 1904," by N. H. Chataway.
- No. 134. Plans and Specifications for Flue Curing Tobacco Barns.
- No. 141. Dry Season and Droughts in Rhodesia, by Rev. E. Goetz, S.J.
- No. 144. Rhodesian Tobacco—Prospects of an Australian Market, by Eric A. Nobbs, Ph.D., B.Sc.
- No. 150. Dry Season and Droughts in Rhodesia, by the Rev. E. Goetz, S.J.
- No. 152. A School of Agriculture for Southern Rhodesia, by Eric A. Nobbs, Ph.D., B.Sc., Director of Agriculture.
- No. 157. Hints on Brickmaking, by G. T. Dyke.
- No. 159. Gwelo Creamery: Hints and Suggestions to Farmers, by W. G. Elliott.
- No. 168. Report on the Methods of Growing, Curing and Selling Bright Tobacco in Virginia, U.S.A., by H. Kay Scorrer.
- No. 183. The Rainy Season in Southern Rhodesia, by the Rev. E. Goetz, S.J.
- No. 184. Cream—Its Separation, Handling and Sale to Butter Factories, by R. C. Simmons.
- No. 186. Concrete and Reinforced Concrete, by E. Hardcastle, M.I.E.E.
- Health and Clothing.
- Malaria: its History, Prevention and Cure, by A. M. Fleming, C.M.G., M.B., F.R.C.S. (Ed.), D.P.H. (Camb.), Medical Director.
- Game Law: Summary of.
- Terms for Analysis by the Department of Agriculture, of Produce, Soils, Water, etc.

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**HANDBOOK OF TOBACCO CULTURE** for  
Planters in Southern Rhodesia. Sold by the Department of Agriculture. 2/6.

## Employment on Farms.

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The Department of Agriculture receives numerous enquiries from persons of varied attainments, age and financial position for openings on farms, as managers, assistants and learners, requiring remuneration on corresponding scales, or willing to give services in return for keep.

In order that work may be found for the above and needs of farmers met, applications are invited from both employers and persons seeking employment. Applications are also invited from artisans, such as masons, bricklayers, carpenters, fencers, well sinkers, concrete workers, and the like who may desire work on farms. In cases where employers have obtained the labour they require, or applicants for employment have found work, it is requested that notification be at once sent to the Department of Agriculture, in order that unnecessary correspondence be avoided.

Replies to the following applications should be addressed to the initials of the advertisers, c/o Director of Agriculture, who will forward the letter to the party referred to.

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### SITUATIONS VACANT.

X. Y. Z.—Wanted farm manager for Northern Rhodesia, cattle and mixed agriculture. Must have first-class references. Apply stating salary required.

H. B. P.—Farm pupil. Premium £120 per annum. General instruction given. Board and lodging provided.

T. S.—Man who understands mealie growing and capable of looking after and working cattle, to manage good farm in Lomagundi district. Half shares.

T. S.—Partner wanted for this year's tobacco crop with capital of £250. Six up-to-date tobacco curing barns on farm.

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### SITUATIONS WANTED.

P. T.—As farm manager. Twenty years' Natal and Rhodesian experience; cattle, mixed agriculture and tobacco.

A. B. B.—As farm manager. Experience in general farming in Natal and Rhodesia. Salary or salary and shares.

L. C. C.—Assistant on general farm. Seven years' farming experience in Ireland.

D. M. K.—Assistant on ranch or mixed farm. £10 per month with board and lodging.

M. J. P.—Good general experience in dairying and general farming. Salary and share of profits.

E. L. S.—Farm pupil on tobacco farm.

H. B.—Manager on ranch. Terms to be arranged.

C. A. B.—Practical experience of farming in Tati Concession.

J. C. B.—Experience in general farming and cattle in Rhodesia.

C. M. C.—Experience in general farming including tobacco, understands brick-making and building, also surveying. Has had experience in managing estates.

B. H. W. F.—Experience as farm assistant.

J. H. G.—Farm manager or assistant. Farmed in Rhodesia eight years, also Home experience. Understands mixed farming.

J. H. W. H.—Prepared to work on shares.

H. W. L.—Assistant on ranch or irrigation farm. Can drive steam, oil and gas engines.

A. M.—Expert cattle man. Thoroughly understands purchase and care of pedigree stock. Lately in charge of pure-bred herds in Transvaal.

C. L. P.—Manager of stock or general farm. Twenty years' experience in general farming.

R. S.—Age 18. Two years' training in agriculture at Harris Institute, Preston. Nine months' practical experience in Transvaal.

C. V. R.—Experienced farm assistant, understands brick making and dipping tank construction.

X. Y. Z.—Young man, age 28, seeks occupation on farm, preferably with family, fair knowledge of language, considerable engineering experience. Small salary. Might run part stock if suitable opening found.

F. W. T.—On general farm, tobacco or stock farm. Salary £5 per month with board and lodging.

H. G. I.—As farm manager; Rhodesian experience.

R. B.—As farm manager or assistant. Terms to be arranged. Experience in general farming and dairying, Rhodesia.

F. R. T.—Twenty-eight years in South Africa; farm experience in Rhodesia; wants salary and share; speaks native language fluently.

S. L. N.—As manager of tobacco farm or mixed farm. Thoroughly experienced.

L. R. H.—As farm manager or assistant. Thorough knowledge of agriculture, etc.; also dairying and cattle; practical knowledge of most farm work and well up in oil engines, etc. State salary.

J. L. D.—Scotsman (unmarried) as farm manager or such like; thorough experience of general agriculture, pure-bred and commercial stock; knowledge of building and concrete work; can keep in repair all farm implements. Satisfactory references from present and former employers.



# Government Notices.

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No. 50 of 1912.]

[8th February, 1912.

(As amended by Nos. 329 and 383 of 1914.)

## AFRICAN COAST FEVER.

*Regulations regarding the movement of cattle and the prevention and suppression of disease.*

1. UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw Government Notices Nos. 329 of 1910 and 308 of 1911 and make the following provisions in lieu thereof :—

2. The various districts of Southern Rhodesia are hereby declared an area infected with African Coast Fever for the purposes of section 5 (2) of the aforesaid Ordinance, and, save as hereinafter set out, all movement of cattle within the said districts is prohibited until further notice.

### *General Movement.*

3. For the purpose of section 22 (1) of the said Ordinance, the following shall be regarded as places within the boundaries of which the movement of cattle may be allowed without special permission :—

(a) Single farm.

(b) An area occupied by an owner or lessee, under one management, comprising contiguous farms and situated within one cattle transport area. The mere possession by an owner or lessee of grazing rights over a contiguous farm or farms shall not constitute occupation of such farm or farms.

(c) An area the property of one owner.

(d) For grazing purposes, an area within a radius of four miles of native kraals situated on unalienated land or in reserves, save and in so far as such area includes any private land.

The sites of such kraals shall be deemed to be the places where they are situated at the date of promulgation of these regulations.

(e) An area under the management or control of any Municipality, Sanitary Board or Village Management Board.

4. Notwithstanding the provisions of the last preceding section, or of section 9 hereof, the Chief Inspector may, on the outbreak of disease, or for such other cause as may be deemed expedient, direct the isolation or quarantine of cattle on a limited area of the aforesaid places.

5. The movement of cattle from place to place may be permitted under the special permission, in writing, of an Inspector, Sub-Inspector, or other officer or person duly authorised by the Administrator to grant such permission.

6. No permission as aforesaid shall permit the movement of cattle—

(a) Without the written consent of the owners, occupiers or managers of occupied land, and in the case of native reserves, of the Native Commissioner of the district over which land or reserve such

cattle will pass, whether along roads or otherwise; provided, however, that refusal to grant such consent shall be in writing, and provided further that if the Controller of Stock or the Chief Inspector shall consider that such consent is withheld without good and sufficient cause he may permit of movement without such consent.

If any such person mentioned above refuse to give consent or to state a reason for refusing to do so in writing, no valid objection shall be deemed to exist and movement may be permitted without such written consent.

- (b) Within a veterinary district as defined in the Schedule annexed hereto from one transport area to or through another without the consent of the Cattle Inspector in charge of such area.
- (c) From any veterinary district to or through another without the consent of the District Veterinary Surgeon of such district.

#### *Slaughter Cattle.*

7. Cattle moved to any centre for slaughter under the provisions of these or any other regulations shall, on arrival, be immediately taken to such quarantine area (if any) as is provided for the purpose and immediately branded with the letters "V.D." on the near hip.

8. Cattle admitted to a quarantine area in terms of the last preceding section shall be slaughtered within twenty-one days of the date of admission, and shall not be permitted to leave the same except for the purpose of being slaughtered at the appointed abattoir, and if found outside such area, except for the said purpose, may be destroyed on the order of the Chief Inspector or Controller of Stock; provided, however, that the Chief Inspector may allow the removal of cattle from such an area under such conditions as he may prescribe.

#### *Transport Cattle.*

9. The use of cattle for draught purposes is prohibited except:—

- (1) Within the boundaries of the places defined in section 3 (a), (b) and (c) hereof.
- (2) Within the boundaries of areas already fixed for the use of cattle for draught purposes in terms of regulations published under Government Notice No. 329 of 1910, or such other areas as may be fixed by the Administrator.

10. Notwithstanding the provisions of section 9, no permit shall authorise the working of cattle

- (a) which are not clearly and distinctly branded with the registered brand of the owner;
- (b) in any wagon or vehicle which shall not have the owner's name and address legibly and permanently inscribed on the right side thereof.

11. No wagon or other vehicle drawn by oxen shall be moved from one cattle transport area into another without the permission of the Cattle Inspectors concerned, and under such conditions as they may impose.

#### *General Provisions.*

12. On the outbreak or suspected outbreak of disease, the Administrator may declare an area of infection around and embracing the place of outbreak or suspected outbreak, and a further area or areas around such area of infection as a guard area, whereupon all movement of cattle into and from place to place within such area or areas shall be immediately suspended, except as hereinafter provided.



A.—*In areas of infection and guard areas:—*

- (1) Cattle in transit by rail may be moved through such area.
- (2) Cattle from beyond the borders of Southern Rhodesia may be detained within such area or areas *en route* to destination.
- (3) Cattle for *bona fide* farming, dairy and slaughter purposes may be moved into such area or areas by permission of the Chief Inspector and under such conditions as he may impose.

B.—*In guard areas only:—*

Cattle may be moved into and from place to place within such area under the conditions of section 6 hereof.

13. The removal of green forage, hay, fodder, bedding reeds, manure or of such other articles as may be reasonably supposed capable of conveying infection, shall be prohibited from areas of infection, save and except with the special permission of the Administrator.

14. Whenever an area shall have been declared under section 12 hereof, every person within such area, or within such further area as may be specified by Government Notice, owning or in charge of cattle shall, upon the death or slaughter because of disease, suspected disease, or accident, of any such cattle, immediately report such occurrence through the nearest Cattle Inspector, Native Commissioner or Police Officer to the District Veterinary Surgeon.

15. Notwithstanding the provisions of these regulations, it shall be competent for the Chief Inspector of Cattle to authorise and direct the movement of cattle for the purposes of isolating, dipping, quarantine, or any other such objects as may be deemed necessary to prevent or suppress an outbreak of disease.

16. Whenever an area shall have been declared an area of infection or guard area in terms of section 12 hereof, any person who shall allow any cattle to stray or be otherwise removed, except as provided for in these regulations, from any one place within such area to another place, or from a place outside of to a place within such area, shall be guilty of an offence against these regulations.

17. All cattle within the limits of the various commonages and townlands, areas of infection and guard areas as declared under section 12 hereof, or depastured on common grazing ground, shall be dipped or sprayed at least once in every three days, unless the Chief Inspector shall authorise the extension of the time between such dipping or spraying, or the entire suspension of the same.

18. In all areas of infection and guard areas sheep and goats shall be dipped at such periods as may be directed by the Chief Inspector.

19. Whenever the owner, occupier, or manager of a farm shall adopt means of cleansing cattle running thereon, either by spraying, dipping, or by any other method, the Chief Inspector may order any natives or other persons having cattle on the same farm to cleanse such cattle, and the Native Commissioner of the district within which the farm is situated may enter into an arrangement with the native owners of cattle to cleanse such cattle at a charge to be mutually agreed upon between the said owner, occupier or manager and the said native owners.

20. All permits for the removal of cattle issued under the provisions of the said Ordinance or of any regulations framed thereunder shall specify legibly and clearly on the face thereof the place from and to which such cattle may be removed, the route by which they shall travel, the number and brands of such cattle, the time allowed for the journey, and such other particulars and conditions as it may be deemed expedient to provide.

21. No permit issued for the movement of cattle shall be taken to authorise any trespass in connection with such movement.

22. Notwithstanding the provisions of these regulations, it shall not be lawful for any owner of cattle to allow any such cattle to be on any road, public outspan, commonage, or any property other than that of the owner, unless they are free from ticks or unless they have been effectively cleansed



by dipping, spraying or other process, within fourteen days of being allowed on such road or other place. Any beast having ten or more ticks on it shall not be considered free from ticks.

23. Any person contravening the provisions of these regulations or the conditions set out in permits issued thereunder, shall, where no higher penalty has been by the said Ordinance or any other law provided, be liable in respect of each offence to a fine not exceeding £20, or in default of payment to imprisonment with or without hard labour for a period not exceeding three months.

#### SCHEDULE "A."

##### VETERINARY DISTRICTS OF SOUTHERN RHODESIA.

###### (1) *Salisbury.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912:—

32. Battlefields; 33. Hartley and Gatooma; 34. Gadzenia Station; 35. Makwiro Station; 36. Norton Siding; 37. Hunyani Tank; 38. 1645½ Peg B. & M. & R. Railways; 39. Salisbury A.; 40. Salisbury B.; 41. Salisbury C.; 42. Salisbury D.; 43. Arcturus; 44. Bromley; 45. Marandellas North; 46. Marandellas South; 48. Headlands Station; 49. Junction Mazoe and Lomagundi Railways; 50. 23-Mile Peg, Lomagundi Railway; 51. Passaford Station; 52. 35-Mile Peg, Lomagundi Railway; 53. Gwibi Tank Halt; 54. Banket, Lomagundi; 55. Eldorado, Lomagundi; 56. Selby Siding; 57. Mazoe; and 58. Kimberley Reefs.

###### (2) *Bulawayo.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912:—

1. Plumtree; 2. Marula Siding; 3. Figtree; 4. Westacre Junction; 5. Bulawayo Area; 6. Heaney Junction; 7. Bembesi Station; 8. Insiza North; 9. Insiza South; 10. Shangani North; 11. Shangani South; 14. Redbank; 15. Nyamandhlovu Station; 16. Malindi Station; 17. Wankies Area; 18. Matetsi Siding; 19. Matopo Terminus; 20. Sabiwa Siding; 21. Gwanda Station; 22. West Nicholson; 23. Belingwe; 59. Essexvale and Balla Balla Areas; 60. Stanmore Siding Area; 61. Filabusi Area.

###### (3) *Gwelo.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912:—

12. Somabula Siding; 13. Gwelo Station; 24. Selukwe Area; 25. Surprise Area; 26. Indiva Siding; 27. Lalapanzi; 28. Iron Mine Hill Siding; 29. Umvuma Siding; 31. Que Que Station.

###### (4) *Umtali.*

An area comprising the native districts of Umtali, Melsetter, Makoni and Inyanga.

No. 24 of 1914.]

[14th January, 1914.

(As amended by Nos. 207 and 395 of 1914.)

#### AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Government Notices Nos. 82, 129, 143, 258, 297 and 326 of 1913, and, in terms of section 12 of Government Notice No. 50 of 1912, declare the following areas of infection and guard areas:—

##### (2) NATIVE DISTRICT OF SALISBURY.

###### (a) *Areas of Infection.*

- (1) Hatfield Estate and Hatfield Plots.
- (2) Salisbury Commonage.
- (3) M.T.C., Gallagher's Lease and Makabusi farms.
- (4) Epworth, Adelaide and Glenwood farms.

(b) *Guard Areas.*

(1) The farms Haydon and Good Hope.

(2) The farms Warren, Lochinvar, the eastern sub-division of Willowvale, Makabusi Outspan, Ardbennie Township, Waterfall, Hopley, Saturday Retreat, Odar Outspan, Stoneridge, Spreckley, Eyrecourt, Eyerston, Retreat, Prospect, Bunker's Hill, Adair, Boutelle, Godaverv, Twentydales, Deanesbrook, Nalire Native Reserve, Galway Estate, Mayfair, Sebastopol, Dispute, Caledonia, Donnybrook, Greengrove, Ventersburg, Lorelei, Letombo Reserve and Greendale.

## (3) NATIVE DISTRICT OF UMTALI.

(a) *Areas of Infection.*

(1) The farms Inodzi, Nyagari, Mountain Home (The B.), Umtali Mission and the Penhalonga Valley.

(2) The farm Mabonda.

(b) *Guard Area.*

The farms Walmer, Sheba, Epsom, Drennan, Banks, Coldstream, Savellein, Umtali Mission, Imbeza Valley, Duris, Fairholm, Ferndale, Barrydale and Forest Farm.

No. 239 of 1914.]

[4th June, 1914.

## AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby, in terms of section 12 of Government Notice No. 50 of 1912, declare the following area of infection and guard area in the native district of Salisbury.

(a) *Area of Infection.*

The farm Bluff Hill.

(b) *Guard Area.*

The farms Crowborough, Parkridge, Fontainebleau, Reserve, Tynwald, Mabel Reign, Avondale, Gillingham, Rainham, Stamford, Homefield, Dove-dale, Stapleford, Glen Lussa, St. Marnocks, Kinvarra, Selby, Mount Hampden, Mount Hampden Reserve, Bendaugh, Glenara, Eskbank, Oldbury, Komani, Hinricksen, Thorn Park, Zizalisari Outspan, Mount Pleasant, Teviotdale, Vainona, Pomona.

## AFRICAN COAST FEVER.

*Transport Areas.*

Government Notice No. 387 dated 10th September, 1914, cancels all previous notices defining the areas within which the use of cattle for draught purposes is permitted and revises the same and in certain cases substitutes new areas. Farmers and others interested should obtain a copy of the notice in question, which appears in the *Government Gazette* dated 11th September, and contains full particulars of these new areas.

No. 381 of 1914.]

[3rd September, 1914.

## COMPULSORY DIPPING.

UNDER and by virtue of the powers vested in me by section 7 of the "Compulsory Dipping Ordinance, 1914," I hereby declare that the provisions of that Ordinance shall be applied in respect of cattle within the following

areas from the date of issue of this Notice, dipping to take place at such intervals as the Chief Veterinary Surgeon shall direct.

The areas under the control of the Municipalities of Salisbury, Bulawayo, Gwelo and Umtali, the Sanitary Boards at Gatooma and Victoria, and the Village Management Boards at Que Que, Melssetter, Penhalonga, Marandellas, Hartley, Enkeldoorn, Avondale, Umvuma, Selukwe and Gwanda.

Further, I do hereby declare that a charge of one penny per head will be made in respect of all cattle dipped at Government dipping tanks, except unweaned calves, for which no charge will be made; and one penny in respect of all horses, mules and donkeys, and  $\frac{1}{2}$ d. in respect of all sheep.

No. 186 of 1914.]

[23rd April, 1914.]

### IMPORTATION OF CATTLE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel the regulations published under Government Notice No. 128 of 1914, and make the following provisions in lieu thereof:—

1. The importation of cattle will be permitted from the Cape Province, the Orange Free State and the Transvaal on the following terms and conditions:—

- (1) A permit shall be required from the Chief Inspector, which may contain such conditions as shall from time to time appear expedient.
- (2) The importation of cattle with more than two permanent central incisor teeth shall not be permitted, except that animals entered in the South African Stud Book or the appendix thereto, with not more than the first and second pairs of permanent incisors, may be imported.
- (3) Applications for permission to import shall be in the form "A" attached hereto, and accompanied by a declaration in the annexed form "B."
- (4) All importations shall be by rail, and for the purposes of importation, Bulawayo shall be the port of entry.
- (5) All cattle imported in terms of these regulations shall, on arrival at Bulawayo, Salisbury or Umtali, be submitted to such examination or tests as the Chief Inspector may direct. If such examination or tests disclose the existence of any destructive disease, the cattle shall be immediately destroyed and the carcasses thereof disposed of in such a manner as a Government Veterinary Surgeon may authorise or require. The Chief Inspector may permit of the age restriction and the tests aforesaid being dispensed with in the case of cattle in transit by rail to any place beyond the borders of Southern Rhodesia.
- (6) All expenses or losses incident to quarantine, examination, testing or destruction as aforesaid shall be borne by the owner of the cattle.

2. The importation of cattle from the United Kingdom of Great Britain and Ireland, the United States of America, the Kingdom of the Netherlands and Germany will be permitted under the following terms and conditions:—

- (1) Importation shall be through and direct from the ports of Cape Town or Port Elizabeth, and there shall be a consignment note or other satisfactory evidence that cattle so imported have come direct from one of the above-mentioned countries.
- (2) The provisions of sub-sections (1), (5) and (6) of section 1 hereof shall apply to importations in terms of this section.



3. Any person introducing cattle in contravention of these Regulations, or failing to comply with any of the conditions attached to permits to import, or furnishing applications, declarations, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, testing, destruction or disposal of carcasses, shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties shall have been provided for such offences by the "Animals Diseases Consolidation Ordinance, 1904"; provided, however, that the penalties imposed by these Regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

## ANNEXURE "A."

## APPLICATION FOR CATTLE IMPORTATION PERMIT.

1. Applicant's Name and Address.....
2. Number and Class of Cattle to be imported.....
3. Area or Farm and District where Cattle are at present located.....
4. Area or Farm and District to which Cattle are to be moved.....

Applicant's Signature.....

Date.....

Application.....

Permit No.....

## ANNEXURE "B."

I, ..... residing on the farm  
 ..... in the district of ..... do  
 solemnly and sincerely declare that the .....  
 (number in writing) animals also enumerated below have been in my pos-  
 session since birth, and that Lung sickness (Contagious Pleuro-Pneumonia)  
 has not existed amongst any of my cattle, nor on my farm, during the last  
 four years, and that these animals have never been exposed for sale in any  
 public market or stock fair.

Number of Animals ..... Bulls ..... Heifers .....

Breed .....

Seller's Name and Address .....

Purchaser's Name .....

Place in Southern Rhodesia to which animals are being sent .....

And I make this solemn declaration conscientiously believing the same  
 to be true.

Declared to at ..... on this ..... day of.....  
 before me,

Resident Magistrate for the District of .....

No. 211 of 1910.]

[4th August, 1910.

IMPORTATION OF CATTLE FROM NORTH-WESTERN  
RHODESIA.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that, notwithstanding the prohibition contained in Government Notice No. 89 of 1908, the importation of cattle from North-Western Rhodesia may be permitted under the following terms and conditions:—

1. The permission of the Chief Inspector of Cattle shall be first had and obtained.

2. All cattle shall be introduced (a) by rail via the Victoria Falls, or (b) by way of the town or port of Feira, which are hereby declared to be ports of entry.

3. All applications for permission to import shall be accompanied by a certificate by a Government Veterinary Surgeon of North-Western Rhodesia that—

(a) the districts from which they come and through which they pass are free from contagious diseases of animals;

(b) the animals in respect of which the application is being made have been examined and are free from contagious diseases of animals.

4. All cattle shall on entry be taken, where possible by rail, to such quarantine area and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, but not less than three months.

5. Any person found introducing cattle in contravention of these regulations, or failing to comply with any of the conditions attached to permits to import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months; provided, however, that the penalties imposed by these regulations shall not exempt from liability to penalties, forfeiture, or destruction, elsewhere provided for

## ANNEXURE "A."

*Certificates under Section 3.*

(a) I hereby certify that I have examined the following cattle belonging to Mr. ....

.....cows and heifers,

.....calves,

.....oxen and bulls,

and that the districts from which they come and through which they will pass in this Territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signed.....  
Government Veterinary Surgeon.

(b) I hereby certify that I have examined the following animals belonging to Mr. ....

.....cows and heifers,

.....calves,

.....oxen and bulls.

In my opinion these animals are free from all destructive diseases.

Signed.....  
Government Veterinary Surgeon.

NOTE.—All numbers are to be expressed in words.

### IMPORTATION OF STOCK FROM THE PROVINCE OF THE CAPE OF GOOD HOPE.

WITH reference to Departmental Notice of 28th February, 1912, it is hereby notified that the said Notice is cancelled, and importation of stock will now be permitted, in terms of Government Notice No. 110 of 1908, from the Province of the Cape of Good Hope, with the exception of the following districts :—

Komgha  
East London

Peddie  
Victoria East  
Kingwilliamstown  
Stutterheim  
Cathcart

Stockenstroom  
Queenstown (Gwatyu Ward  
only)  
Glen Grey  
Maclear  
Elliot Slang River  
Wodehouse  
Barkly East

No. 364 of 1914.]

[27th August, 1914.

### REGULATIONS GOVERNING IMPORTATION OF LIVE STOCK, ETC.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," as amended from time to time, I do hereby cancel the regulations published under Government Notices Nos. 295 and 394 of 1908; 38, 61 and 263 of 1909; and 60 of 1911 and 188 of 1912, 47 of 1913, and so much of any other regulations as may be repugnant to or inconsistent with the subjoined regulations, which are hereby declared to be of full force and effect.

1. The importation of the following animals from the respective countries or districts enumerated is prohibited, owing to the existence or supposed existence of destructive diseases affecting the said animals in the said countries :—

(1) All animals and dogs as defined by the aforesaid Ordinance from—

India,  
Mauritius,  
Persia,  
British Burmah,  
Assam,  
China and bordering countries, including Korea,  
French Indo-China,  
Dutch East Indies,  
Hong-Kong,  
Federal Malay States,  
The Philippines,  
Zanzibar,

and all other countries where surra is known or suspected to exist.

(2) Pigs from the Union of South Africa, the Bechuanaland Protectorate, the Tati Concession, and other countries in which swine fever exists or is suspected to exist, subject, however, to the exceptions contained in the proviso to this section.

(3) Dogs from the territories of Northern Rhodesia and Portuguese East Africa, subject, however, to the exceptions in the proviso of this section.

(4) Sheep and goats from the districts of Albany, Alexandria, Bathurst, Bedford, East London, Fort Beaufort, Humansdorp, Jansenville, Kingwilliamstown, Komgha, Peddie, Somerset East, Stockenstroom, Uitenhage and Victoria East, in the Cape Province; the districts of Barberton, Lydenburg, Marico, Pretoria, Rustenburg, Waterberg and Zoutpansberg, in the Transvaal; Swaziland, Portuguese East Africa, Northern Rhodesia.



Provided, however—

- (a) that the Chief Inspector may at his discretion permit the importation of pigs, sheep and goats from the above-mentioned places on production of a certificate signed by a duly authorised Government Veterinary Officer in the form of Schedule "A" attached hereto;
- (b) that the importation of dogs required for scientific purposes only may be permitted from the places mentioned in sub-section (3) hereof, by the Chief Inspector, in writing, subject to such conditions as may be imposed by him;
- (c) that dogs, sheep, goats and pigs from countries from which importation is permitted may be introduced *via* the port of Beira, provided that all such animals shall be transferred directly after disembarkation to the railway trucks at Beira, and conveyed thence to Umtali without leaving the said trucks.

2. The areas set out in Schedule "B" hereto are hereby appointed for the depasturing and quarantining of animals for slaughter in connection with the places therein mentioned.

3. The several districts of Southern Rhodesia are hereby declared to be an area infected with scab amongst sheep and goats, and the movement of all sheep and goats from any farm to beyond the limits thereof, or from their usual grazing ground within the limits of any town lands or native reserves to any other place, is prohibited, except under the written permit of an Inspector or Sub-Inspector. Such permit shall set forth the number and description of animals to be moved, the route they shall travel, and the period for which the permit shall be in force. In cases where it may be necessary or desirable, the person to whom such permit is issued may be required to cause the animals referred to therein to be dipped before being moved.

4. The introduction of sheep and goats is prohibited except—

- (a) as specially provided for by section 1 hereof;
- (b) from places not mentioned in section 1, if accompanied by a certificate in the form set out in Schedule "C" hereof.

5. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by rail shall immediately report such arrival to the Veterinary Office at Salisbury, Bulawayo and Umtali respectively, and no such animal shall be detained at any intermediate station without the written authority of a Government Veterinary Surgeon.

6. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by road shall immediately report such arrival at the Police Camp nearest to the place where such entry is made, and the officer in charge of such Police Camp shall immediately report to the Veterinary Department, which shall direct what steps are to be taken to test such animals with mallein, as in the following clause provided.

7. All horses, mules and donkeys, upon entering Southern Rhodesia, shall be tested with mallein, and the owner or person in charge of such animals shall in all respects carry out the lawful directions of the Inspector while such animals are being tested: provided that this regulation shall not apply to animals in transit through Southern Rhodesia which are not detained *en route*.

8. Horses, mules and donkeys lawfully in this Territory, and required for purposes necessitating frequent crossing of the border, may be allowed to so cross on such terms as to registration, branding, testing and conditions as the Chief Veterinary Surgeon may from time to time deem expedient to prescribe.

9. An Inspector may direct the thorough cleansing and disinfecting of trucks which may be reasonably suspected of being sources of infection of any destructive disease, and may direct the destruction of truck fittings.

fodder, excreta, or other matter or thing which may be reasonably calculated to convey such infection.

10. Any persons contravening the provisions of these regulations, or the instructions or directions given in terms of these regulations, shall be liable in respect of each offence to a penalty not exceeding twenty pounds, or in default of payment to imprisonment with or without hard labour for a period not exceeding three months, unless where more or heavier penalties have by the aforesaid Ordinance, or by other regulations framed thereunder, been expressly provided.

#### SCHEDULE "A."

##### *Certificate.*

Issued under provisions of section 1, Government Notice No. 364 of 1914.

This is to certify that the animals enumerated below are, in my opinion, free from any destructive disease, including heartwater; and, to the best of my knowledge and belief, have not been in contact with any infected animals, nor come from, or through, a locality where any such disease is known to exist or has existed for twelve months from date hereof.

Date....., 19...

Place .....

Signature of

Government Veterinary Surgeon.

Number and general description of animals:

.....Pigs, .....Sheep, .....Goats.

Place from which animals are to be sent:

Owner's name and address:

Place in Southern Rhodesia to which it is desired to send the animals

#### SCHEDULE "B."

Description of areas set apart for depasturing and quarantining of animals for slaughter.

*Salisbury.*—A fenced piece of land, 400 acres in extent, situated on the Makabusi River below Maggio's plot, within the Salisbury commonage and towards the southern boundary thereof.

*Bulawayo.*—That piece of fenced land situated on the Bulawayo commonage between the railway line, to the south, and the Solusi road, adjoining and to the south-west of the Government dipping tank, in extent 1,000 acres more or less.

*Gwelo.*—Starting from a point where the Ingwania road crosses the railway, along this road past the sanitary stables to a point a quarter of a mile west, thence in a line parallel with the railway to the Gwelo River, thence along the river to the commonage beacon No. 11, thence in a straight line to the Shamrock road where it is intersected by the Scout's Spruit, thence along the Shamrock road to where it joins the Main Street extension, thence along this to the railway line, and down this to the starting point.

*Umtali.*—A piece of fenced land situated on the old Darlington Farm section of the Umtali commonage.

*Penhalonga.*—A piece of fenced land situated on plot No. 2, Imbeza plots.

*Selukwe.*—A piece of fenced land, in extent about 300 acres, situated on the farm Sebang and adjacent to the township of Selukwe.

## SCHEDULE "C."

I, ..... residing at .....  
 in the district of... ..... in the.....  
 Colony, do solemnly and sincerely declare that the animals enumerated  
 below are free from any contagious disease, including scab, and have not  
 been, in contact with any infected animals within six months from date  
 hereof, and that, to the best of my knowledge and belief, such animals, in  
 travelling to.....† station, will not come in contact with  
 any animals amongst which scab or any other contagious disease exists.

And I make this solemn declaration conscientiously believing the same  
 to be true.

Declared to at.....on this.....  
 day of.....before me.

.....  
 Magistrate, Government Veterinary  
 Surgeon, Scab Inspector, or Police  
 Officer of district from which animals  
 are being sent.

Number and general description of animals being sent.....  
 Owner's name and address.....

Place in Southern Rhodesia to which animals are being sent.....  
 † Station within Colony of origin.

No. 375 of 1912.]

[28th November, 1912.

## IMPORTATION OF POULTRY.

UNDER and by virtue of the powers vested in me by the "Animals  
 Diseases Consolidation Ordinance, 1904," as amended by the "Animals Dis-  
 eases Amendment Ordinance, 1910," I do hereby declare and make known  
 that the following regulations shall be in force and effect from date of pub-  
 lication hereof :—

(1) All poultry imported by rail shall be inspected by an Inspector or  
 Sub-Inspector at Plumtree, Bulawayo or Umtali.

(2) Should any consignment of poultry shew symptoms of disease, or  
 should such Inspector or Sub-Inspector have reason to believe that any dis-  
 ease exists in, or that infection is likely to be conveyed by such consignment,  
 he may order the detention and isolation of the whole consignment for such  
 period as he may deem necessary.

(3) The Chief Inspector may order the destruction of all poultry which  
 he has reasonable grounds for believing to be diseased or likely to convey  
 infection.

THE following extract from Live Stock Regulations, printed on page 150  
 of the South African Railways Official Tariff Book, is published for general  
 guidance :—

Poultry are not accepted by rail unless they are placed in a crate and  
 the following conditions are complied with :



(1) The size of the crate shall be 3 feet 6 inches by 2 feet 9 inches external floor dimensions; for turkeys and geese the height shall be 30 inches; and for fowls, ducks, and poultry of a like size, the height shall be 20 inches.

(2) Each crate must contain two drinking vessels filled with pure water, such vessels to be not less than five inches in depth, of the unspillable type, one being fixed at opposite corners of the coop.

(3) Each crate shall contain two receptacles for food of a suitable size, filled with suitable food other than whole maize.

(4) The birds must not be over-crowded in the crates, and in no case must there be more than 20 fowls, ducks or other birds of a like size, or ten turkeys or geese.

(5) Different species of birds must not be placed in the same coop.

Unless coops, crates, and the like are strong enough to bear ordinary transit handling, the Administration will not accept responsibility for loss.

No. 382 of 1914.]

[3rd September, 1914.

#### IMPORTATION OF PLANTS, ETC., REGULATIONS: EXAMINATION FEES.

UNDER and by virtue of the powers vested in me by the "Importation of Plants Regulation Ordinance, 1904," I do hereby cancel sub-section (4) of section 3 of the regulations published under Government Notice No. 259 of 1913, and make the following provisions in lieu thereof:—

- "(4) An examination fee of three pence for every ten packages or cases or any less number in a consignment with a minimum fee of one shilling per consignment will be charged, regardless of number of classes of plant present. In the case of plants calling for treatment a fee of five shillings for each use of the fumigating chamber will be levied."

#### SUMMARY OF THE GAME LAWS.

Game is divided into three distinct classes, described as follows:—

- (a) Birds and Small Buck.
- (b) Bushbuck, Hartebeest, Impala, Lechwe, Pookoo, Roan and Sable Antelope, Sitatunga, Tsessebe, Waterbuck, and Wildebeest.
- (c) Royal Game, which includes Eland, Elephant, Giraffe, Gemsbok, Hippopotamus, Inyala, Koodoo, Ostrich, Rhinoceros, Springbuck and Zebra.

The shooting season for Class "A" is as follows:—

In Mashonaland:

Birds from 1st May to 30th September.  
Small Buck from 1st May to 31st October.

In Matabeleland:

Birds and Small Buck from 1st May to 31st October.

To shoot in Class "A" a licence costing £1 per annum is required. This entitles holders to hunt in both Provinces during the open season.

Class "B."—The season opens on 1st July and closes on 30th November in both Provinces. The licence fee is £25 for non-residents and £5 for persons having their domicile in Southern Rhodesia. This licence entitles the holder to shoot up to 15 head, which number may be increased to a total of 25 upon payment of a further sum of £15 in the one case and £5 in the other.

Class "C."—The Administrator may, if he is satisfied that the animals are actually required for scientific purposes, grant to the holder of a game licence permission to shoot or capture any of the species included in this Class. Such permit requires a £5 stamp. Applications in writing, together with proof of *bona-fides*, should be addressed to the Director of Agriculture.

Game for Farming Purposes.—Permits may be granted for the capture of Eland, Ostrich, Zebra or other animals for the purposes of breeding or farming. Such permits require a stamp of the value of £1 and remain in force for six months. Application, accompanied by a sworn declaration, should be made through the Director of Agriculture or the Civil Commissioner of the district.

Game Injuring Crops.—The occupier of any cultivated land or any person acting under the authority of such occupier, may at any time destroy game actually doing damage on such land.

Elephants on Occupied Farms, Melsetter.—The destruction of Elephants when found on occupied farms on the High Veld in Melsetter District is authorised (*vide* Government Notice No. 284 of 1908).

#### *Open areas.*

The shooting or capturing of all classes of game with the exception of ostriches and other birds classified as game is permitted within the following areas in the Hartley district and the Sebungwe district until further notice, and Lomagundi district for one year from 1st November, 1913 :—

Hartley District.—From the railway bridge on the Umfuli River, thence north-westwards along the Umfuli River to where it joins the Umniati River, thence southwards along the Umniati River to where it joins the Umsweswe River, thence eastwards along the Umsweswe River up to the drift at the Lydia Mine, thence along the old road from Lydia Mine to Etna Mine and to Inez Mine, thence northwards along the road from Inez Mine to Hartley, thence in the direction of the railway bridge to the starting point on the Umfuli River.

Sebungwe District.—From the confluence of the Sengwe and Lutope Rivers up the Lutope to its headwaters, thence in a south-east and easterly direction following the southern edge of the escarpment, leaving Meare's farm to the south, to the Mafungabusi Peak, thence northwards along the escarpment to the Njelele River, and down that river to its confluence with the Sanyati River, thence northwards down the Sanyati River to its confluence with the Piriwiri River, thence direct in a north-westerly direction to Picaninyemba, and thence along the footpath to Nenyunka on the Sengwe River, thence southerly up the Sengwe River to its confluence with the Lutope.

Lomagundi District.—An area bounded by a line drawn from the junction of the Angwa and Mkwichi Rivers, in a southerly direction up the Angwa to its junction with the Chumsenga River; thence easterly direct to the junction of the Hunyani and Msitkwe Rivers; thence northerly down the Hunyani to a point opposite Mokore Hill; thence westerly to the junction of the Angwa and Mkwichi Rivers.

Also an area bounded by a line drawn from the junction of the Chumsenga and Angwa Rivers up the Angwa to the point where the Sinoia Urungwe Road crosses that river; thence along this road in a south-easterly



direction to the Hunyani River; thence down that river to its junction with the Mesitkwe River; thence westerly direct to the point first named.

Ostriches, Charter and Chilimanzi Native Districts.—Notice No. 154 of 1914 permits the shooting or capturing of ostriches within fenced areas in the above districts for a period of six months from 2nd April, 1914.

Elephants, Hartley District.—Notice No. 168 of 1914 permits the shooting or capturing of elephants on or within five miles of the farm Walden, in the Hartley District, for a period of one year from 9th April, 1914.

The game specified may be shot in these open areas without a licence.

Game in Class "A" may be hunted in the close season until further notice on private land in the Melsetter District by holders of a licence.

Protected Areas.—No game may be hunted or killed within the limits of the Commonage or Townlands of Bulawayo and within a radius of two miles of the Court House, Gwelo, or within the Urungwe Game Sanctuary, as defined by Government Notice No. 237 of 1906.

"Locust Birds" are strictly protected, *vide* Government Notice No. 390 of 1912.

Export of Game.—No living Game or the Eggs of any Game Birds may be exported beyond the limits of Southern Rhodesia without a written permit.

Shooting on Private Land.—A licence does not entitle the holder thereof to shoot on private land without the permission of the land-owner.

Farmers Shooting Game on their Farms.—By taking out a special £1 licence, farmers may at any time shoot any game on their land. "Game" does not include any birds, except ostriches.

No. 390 of 1912.]

[19th December, 1912.

#### PROTECTION OF LOCUST BIRDS.

UNDER and by virtue of the powers vested in me by the "Game Law Consolidation Ordinance, 1906," I do hereby declare that the following Locust Birds :—

- (1) Great Locust Bird or White Stork (*Ciconia alba*);
- (2) Lesser Locust Bird or Nordmann's Pratincole (*Glareola melanoptera*);
- (3) Small White Heron or Cattle Egret (*Bubulcus ibis*);
- (4) Wattled Starling (*Dilophus carunculatus*);

are added to class "A" of the said Ordinance, and shall be strictly protected, and not hunted or destroyed, throughout Southern Rhodesia for a period of five years from date hereof.

No. 249 of 1908.]

[27th August, 1908.

#### PROTECTION OF TREES.

IT is hereby notified for public information that any person who shall cut down for use as fuel, or for any other purposes than *bona-fide* farming, mining or manufacturing purposes, or cause to be so cut down the "Wild Westeria" (native name M'Pakwa or M'poea) tree, will be liable to prosecution for contravention of the provisions of the Forest and Herbage Preservation Act, 1859, and upon conviction to a fine not exceeding £100, or to imprisonment with or without hard labour for a term not exceeding six months, or to such fine and imprisonment, or to such imprisonment without a fine.



No. 375 of 1914.]

[3rd September, 1914.

## WATER ORDINANCE.

IT is hereby notified for public information that His Honour the Administrator has been pleased to appoint the Chief Clerk, Attorney General's Office, to be Water Registrar in terms of the Regulations published under the "Water Ordinance, 1913."

All communications for the consideration of the Administrator in terms of the said Ordinance or Regulations should be addressed to the Water Registrar, Law Department, Salisbury.

No. 399 of 1914.]

[17th September, 1914.

## AGRICULTURAL STATISTICS.

UNDER and by virtue of the powers conferred on me by the "Agricultural Statistics Ordinance, 1914," I do hereby make the subjoined provisions for the collecting of statistics or estimates in terms of the said Ordinance.

1. Statistics shall be collected by the Director of Agriculture in relation to live stock, maize and tobacco.

2. The forms set out in Annexures "A" and "B" hereto shall be used for the purpose of collecting such statistics, and should be completed in accordance with the instructions accompanying the same, by all persons in charge of farms or estates, whether as owners, lessees, managers, servants or occupiers or acting on behalf of such persons, and transmitted to the Director of Agriculture not later than the date fixed in the said form.

3. Any person who without reasonable cause makes default in complying with the requirements of the last preceding section shall be liable on conviction to a fine not exceeding fifty pounds, or in the case of a continuing default to a fine not exceeding one pound for every day during which the default continues.

## ANNEXURE "A."

*Southern Rhodesia.*

AGRICULTURAL STATISTICS, 1914.

*Live Stock.*

|                                    | Owned by<br>Europeans. | Owned by<br>Natives. |
|------------------------------------|------------------------|----------------------|
| Cattle:                            |                        |                      |
| Cows and heifers over one year old | .....                  | .....                |
| Heifers under one year old         | .....                  | .....                |
| Bulls in use for stud purposes     | .....                  | .....                |
| Oxen of all ages, and bull calves  | .....                  | .....                |
| Horses                             | .....                  | .....                |
| Mules                              | .....                  | .....                |
| Donkeys                            | .....                  | .....                |
| Sheep:                             |                        |                      |
| Merino                             | .....                  | .....                |
| All other                          | .....                  | .....                |
| Goats                              | .....                  | .....                |
| Pigs                               | .....                  | .....                |
| Poultry, all kinds                 | .....                  | .....                |
| Eggs sold during last 12 months    | .....doz.              | .....doz.            |
| Cream                              | .....lbs.              | .....lbs.            |
| Butter                             | .....                  | .....                |
| Wool                               | .....                  | .....                |

*Crops.*

|             | Acres<br>under crop<br>in 1914. | Total yield.     | Amount reserved for<br>home consumption<br>and seed. |
|-------------|---------------------------------|------------------|--|
| Maize ...   |                                 | bags of 203 lbs. | bags of 203 lbs.                                     |
| Tobacco ... |                                 | lbs. net.        | lbs. net.  |

Signature.....

## ANNEXURE "B."

*Southern Rhodesia.*

## AGRICULTURAL STATISTICS, 1914.

*Special Return in respect of Commonages.*

|                                    |     |     | Owned by<br>Europeans. | Owned by<br>Natives. |
|------------------------------------|-----|-----|------------------------|----------------------|
| Cattle:                            |     |     |                        |                      |
| Cows and heifers over one year old |     |     | .....                  | .....                |
| Heifers under one year old         | ... |     | .....                  | .....                |
| Bulls in use for stud purposes     | ... |     | .....                  | .....                |
| Oxen of all ages, and bull calves  | ... |     | .....                  | .....                |
| Horses                             | ... | ... | .....                  | .....                |
| Mules                              | ... | ... | .....                  | .....                |
| Donkeys                            | ... | ... | .....                  | .....                |
| Sheep:                             |     |     |                        |                      |
| Merino                             | ... | ... | .....                  | .....                |
| All other                          | ... | ... | .....                  | .....                |
| Goats                              | ... | ... | .....                  | .....                |
| Pigs                               | ... | ... | .....                  | .....                |
| Poultry, all kinds                 | ... | ... | .....                  | .....                |

Signature.....

No. 400 of 1914.]

[17th September, 1914.

## WATER ORDINANCE.

UNDER and by virtue of the powers vested in me by section 27 of the "Water Ordinance, 1913," I hereby appoint the under-mentioned gentlemen as unofficial members of Water Courts:—

Colonel O. Baker, E. A. Begbie, M.L.C., M. E. Cleveland, M.L.C., B. I. Collings, M.L.C., L. Cripps, M.L.C., B. G. Derry, J. A. Edmonds, M.L.C., J. T. English, F. Eyles, R. le S. Fischer, W. V. Fleming, H. P. Fynn, R. S. Garvin, H. S. Gifford, R. D. Gilchrist, Lieut. Colonel R. Grey, C.V.O., C.M.G., M.L.C., G. M. Huntly, E. M. Jarvis, J. L. Martin, A. McAllister, J. McChlery, M.L.C., T. Meikle, Geo. Mitchell, M.L.C., H. U. Moffat, A. R. Morkel, Colonel W. Napier, C.M.G., H. M. Oakley, T. Pretorius, A. Stewart Richardson, J. Struthers, C. C. Townsend, Dan Vincent, J. Watson, J. H. Williams, G. C. Woodforde, F. E. Woods, O. Zimmerman.

## Department of Posts and Telegraphs, Southern Rhodesia.

Postal Notice No. 12 of 1913.

### AGRICULTURAL PARCELS POST.

IT is hereby notified for public information that, on and after the 1st August, 1909, any article produced, and, if manufactured, produced and manufactured within Southern Rhodesia may be transmitted by Agricultural Parcels Post at the reduced rate of threepence per lb. or fraction thereof, up to a limit of eleven lbs. in weight.

The Agricultural Parcels Post is designed to bring the producer into direct communication with the consumer, and is available for the transmission of :—

|                        |             |              |
|------------------------|-------------|--------------|
| Biscuits               | Dried Meats | Plants       |
| Bread                  | Eggs        | Poultry      |
| Butter                 | Flour       | Seeds        |
| Confectionery          | Flowers     | Sugar        |
| Cigarettes             | Honey       | Tobacco      |
| Dried & Bottled Fruits | Jam         | Wool Samples |

and other articles produced within Southern Rhodesia. It does not extend beyond the borders of Southern Rhodesia.

The senders of articles at the reduced tariff applicable to the Agricultural Parcels Post will be required to sign a declaration that the contents are the *bona fide* produce of Southern Rhodesia.

The limits of size and weight, and the general regulations, are those applicable to the Inland Parcels Post.

G. H. EYRE,  
Postmaster General.

General Post Office, Salisbury,  
31st March, 1913.

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## **Transport Contractors**

When in Salisbury *re* Customs, Forwarding and Cartage requirements you should visit

**ELCOMBE & CO.**

who undertake all classes of **Heavy** and **Light** transport.

*Travelling Conveyances always obtainable.*

Agents for the B. & M. Railways, the B.S.A. Co. and leading commercial houses

**ELCOMBE & CO., Salisbury**







Staff of Department of Agriculture, Salisbury.

Bottom row from left to right: Miss E. Knight; Miss H. M. Frachet; Miss O. Knight; H. G. Mundy, Agriculturist and Botanist; Dr. E. A. Nobbs, Director of Agriculture; L. E. W. Bevan, Veterinary Bacteriologist; G. N. Blackshaw, Agricultural Chemist; A. G. Holborow, Assistant Agricultural Chemist. Middle row from left to right: F. A. Feare; J. A. T. Walters, Assistant Agriculturist and Botanist; H. A. Harper, Financial Clerk; R. V. Buxton; R. W. Jack, Entomologist; W. E. Meade, Sub-Editor, *Agricultural Journal*; L. Thomson. Top row from left to right: E. E. Philip; J. J. Boccock, Forestry Adviser; R. L. Thompson, Assistant Entomologist; F. B. Willoughby; A. J. Crisp; D. J. Koch; R. J. M. Kelly.



# THE RHODESIA Agricultural Journal.

*Edited by the Director of Agriculture,  
assisted by the Staff of the Agricultural Department.*

PUBLISHED BI-MONTHLY.

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## Editorial.

*Correspondence on subjects affecting the farming industry of Southern Rhodesia is invited. Enquiries will be replied to direct, or through the medium of the JOURNAL. An interchange of ideas and suggestions between farmers will be particularly welcomed. Contributions of a suitable nature for insertion in this JOURNAL will be much appreciated. All communications regarding these matters, and advertisements, should be addressed to the Editor, Department of Agriculture, Salisbury.*

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AGRICULTURAL DEPARTMENT STAFF.—We reproduce in this issue a photograph of the staff of the Agricultural Department, taken shortly before certain members left for the front. The officials who have responded to the call are:—Dr. Nobbs (Director of Agriculture), Messrs. Burt, Buxton and Feare, who are with the 1st Rhodesian Regiment, and Mr. H. G. Mundy, who is on his way to the Old Country to enlist there.

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THE FARMERS' TOUR.—We publish in this issue an address delivered by Mr. J. H. Finch, one of the Rhodesian



delegates to the Farmers' Tour, at a meeting of the Marandellas Farmers' Association on the 7th November. This is the first of a series of lectures Mr. Finch will give enent the tour, and we feel sure his remarks, which deal with the tobacco question, will be read with much interest. After the address in question, Mr. Finch told of some new and interesting things he had seen, and exhibited two of them, which we commend to the notice of our readers. The first was the "Nuespray," an attachment for watering cans, to displace the ordinary rose, and considered to be a great improvement on the latter. Mr. Finch thinks the "Nuespray" should be of great value to tobacco growers for their seed beds and to all who have to use watering cans.

The second article Mr. Finch exhibited was the "Fastfit" wrench, a spanner that automatically takes any size nut in reason without adjusting. Mr. Finch also invited his hearers to call at his place and inspect the latest automatic Poultry Feeder and Exerciser in use, besides other ingenious implements he had brought back with him.

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**A MONTHLY JOURNAL.**—Owing to the unsettled conditions caused by the War, it has been decided that the time is not opportune to proceed with the original intention of publishing the *Journal* monthly as from the New Year. This decision, which circumstances render unavoidable, is much regretted, for without doubt the usefulness of the *Journal* would be considerably enhanced by a monthly issue. The *Journal* will, therefore, continue to be published bi-monthly. The present number completes Volume XI., which in the ordinary course of events would have terminated in August last, and the first number of Volume XII. will appear in February, 1915.

Perhaps a few words regarding the scope of the *Journal* may not be out of place here. The *Journal* during the last few years has increased very considerably in popularity, and we are now printing off 1,700 copies, which is our high-water mark. Up to the outbreak of war our revenue from advertisements had steadily increased until there was reason to believe that the *Journal* would before long be self-supporting. The *Journal* has naturally been affected by the depression that exists everywhere, though not to the extent that most publica-

tions have, but we feel sure that with the restoration of normal conditions, the *Journal* will continue its prosperous career.

We are constantly receiving flattering letters regarding the general standard of the *Journal*, and these are very gratifying. Many of our correspondents comment upon the fact that the articles in the *Journal* are free from technicalities, and can be readily followed by the layman. We might here remark that the endeavour has always been to make the *Journal* of practical use to the ordinary farmer, and never to write over the heads of our readers. In this we appear to have succeeded, and we shall continue to disseminate what advice and information we have to offer in the simplest form possible.

Although our subscribers' list includes the large majority of the farmers of this country, there are quite a number whom we should like to see subscribing. To this end we appeal for the assistance of our readers, and shall much appreciate any efforts on their part to obtain subscribers.

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TRANSPLANTING TOBACCO PLANTS. — Many tobacco growers have already adopted the practice of dipping the roots of tobacco plants in clay water when transplanting in order to check the temporary wilting of the plant, and in this connection it is interesting to note that in a recent issue of "*Tropical Life*," a reference is made to the use of a mixture of tobacco dust and water for the same purpose.

Professor Karutz of Cuba, in regard to the transplanting of tobacco, says:—"The first thing I set out to avoid is the temporary fading of the plants, which at present is only too apparent as a rule with freshly set-out plants: this I believe could be avoided by using a mixture of tobacco dust and water, as is done on well-managed estates in the United States of America. There the roots of each seedling are dipped into a mixture of tobacco dust and water. This mixture resembles mud, adheres closely to roots, and contains sufficient moisture to prevent them getting dry before they recover themselves sufficiently to draw up the moisture from the ground. This is the case even when the plants are left lying about (which, by the way, should not be allowed) waiting for the tobacco planting labourer to 'pop them in.' Instead, therefore, of



the seedling carrier simply using his hands or arms to hold the young plants, he should use an oblong-shaped bucket half filled with the mixture in which the plants have been placed; the same man could carry a supply and plant them as he goes in holes made by himself or another man on ahead. Relays of buckets with plants could be brought up from the nurseries and the 'empties' taken back to be refilled. By such means time and labour are economised, and the plant remains fresh right through and picks up much quicker than by the usual drop-as-you-go method. . . . In Cuba and other centres where cigars, cigarettes and tobacco are manufactured, the dust is obtained from the sweepings, but it can also be obtained on producing estates by pounding up refuse or inferior leaves, or even by crushing the tobacco stems into a coarse powder. When mixing the dust with water do not use more of the latter than is necessary to turn the dust into mud, for if too watery it does not adhere to the plants."

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"FERTILISERS, FARM FOODS, SEEDS AND PEST REMEDIES ORDINANCE, 1914."—The regulations framed in connection with the above Ordinance are published in the *Government Gazette*, dated 2nd October, and as they are too lengthy to reproduce in this *Journal*, we would advise farmers and those interested to obtain a copy of the *Gazette*. The Ordinance, it will be remembered, was passed at the May session of the Council, and was promulgated on the 3rd July.

The prime object of the Ordinance is protection—protection to the farmer and protection to the merchant. There is singular scope for fraud in the manufacture of fertilisers, and now that the use of fertilisers has become so universal in this Territory, it was considered the time had arrived to introduce legislation on the subject, as is done in other countries.

The machinery by which control is exercised is extremely simple. Firstly, each special class of fertiliser must be registered every year; secondly, the composition thereof must be guaranteed by the manufacturer or his agent; thirdly, the receptacle containing the fertiliser must have the brand under which the fertiliser is registered imprinted thereon for purposes of identification; and, fourthly, the Government has power at any time to ascertain whether the composition of the fertiliser conforms to the registered guarantee.



Similar measures to the foregoing are provided for to prevent the adulteration of farm foods, while the regulations aim at securing the purity of pest remedies used in the fruit industry. In regard to seeds, no standard can be imposed, but it is provided that samples, taken in accordance with the regulations, can be tested and a certificate given to the purchaser describing their quality at the time of examination and indicating whether they are of normal vitality and purity, or whether they contain deleterious matter.

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THIRD INTERNATIONAL CONGRESS OF TROPICAL AGRICULTURE, LONDON, 1914.—The Third International Congress of Tropical Agriculture opened at the Imperial Institute on Tuesday, 23rd June, and met daily, except on Saturday and Sunday, until Tuesday, 30th June.

The Congress was presided over by Professor Wyndham R. Dunstan, C.M.G., M.A., LL.D., F.R.S., Director of the Imperial Institute, and brought together eminent representatives of tropical agriculture from all parts of the world. This was the first Congress that had been held in the United Kingdom, the first having been held in Paris in 1905 and the second in Brussels in 1910. Very many subjects of great importance were discussed, the speakers including Mr. Lewis Harcourt, Secretary of State for the Colonies, and Lord Kitchener, the latter of whom took the chair at a discussion on the improvement of cotton cultivation and delivered a valuable address on cotton growing in Egypt. The papers read and the discussions that took place were to be printed in book form, and are expected to be ready shortly.

A subject of very great importance was dealt with by Professor Dunstan in his presidential address, when he referred to the question of establishing an Imperial College of Tropical Agriculture. What is now required, said Professor Dunstan in the course of his remarks, 'is an agricultural college in the tropics, to which men with the diploma of an agricultural college at Home can proceed to receive a technical education in the subject, and thoroughly qualify themselves for the profession of tropical agriculture. Beyond the immediate requirements of the ordinary student, explained

Professor Dunstan, such a college should become a most important centre of tropical agricultural research, not merely for its own advanced students, but for trained investigators of special subjects from all parts of the world, who would there find ample materials and opportunities for their researches. The urgent need for such a college was clearly explained by Professor Dunstan, who said: "There is no subject at the present time in the whole field of human activity which demands greater attention than the organisation of those agencies which make for the agricultural productivity of the tropical regions of the world."

The site Professor Dunstan suggests for the college is Ceylon, which he considers is the country best adapted for the purpose. Other colleges would no doubt in course of time be built in other parts of the tropics, but Ceylon, considers Professor Dunstan, will efficiently serve the needs of the whole of the Middle East and of Eastern and Central Africa.

The funds required are estimated at about £50,000, and it is understood that the Government of Ceylon is favourable to the proposal, while the Secretary of State for the Colonies has declared his interest in and sympathy with the scheme. Judging from the trend of Professor Dunstan's remarks, there is every reason to believe that the scheme will materialise, and we can only add our sincere wish that the college will before long be *au fait accompli*.

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**QUININE FOR SETTLERS.**—We are informed that the quinine imported by the Government for sale to the settlers in Southern Rhodesia has now arrived and is being distributed. This quinine will be on sale at the shops of all chemists and druggists who are willing to distribute it at the prices agreed upon. In outside districts where no chemists or druggists exist, arrangements will be made for its distribution through the agency of post-offices where they exist, police stations or Native Commissioners' headquarters.

The prices to be charged are liable to alterations from time to time, in accordance with fluctuations in the market price of quinine, but we are informed that the cost to the public of the present consignment is as follows:—

*Bottles of 100 tablets each.*

|                                 |                 |
|---------------------------------|-----------------|
| Tablets of 5 grains each ... .  | @ 2/6 a bottle. |
| Tablets of 3 grains each ... .. | @ 1/9 a bottle. |
| Tablets of 2 grains each ... .. | @ 1/3 a bottle. |
| Tablets of 1 grain each ... ..  | @ 1/- a bottle. |

A list of the chemists who are willing to stock this Government quinine, and also a list of the post offices and other stations where it can be obtained, will be published in the *Government Gazette* at an early date.

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LOCALLY-GROWN WHEAT AND OATS.—At the end of this *Journal* will be found a notice to the effect that the Railway Company are prepared to convey locally-grown wheat and oats over the sections Umtali—Salisbury and any station Victoria to Umvuma (inclusive)—Salisbury at a special rate. The new rate constitutes a considerable reduction over the old rate, with the difference that in order to obtain the benefit of the special rate consignments must come forward in full truck loads. We are afraid that Rhodesia is hardly as yet a large enough wheat or oats producing country for the concession to be fully appreciated, but herein would appear to be another opportunity for the adoption of the co-operative principle whereby farmers may combine to obtain the benefit of the lower rate.

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REAPER AND BINDER.—In the June, 1914, issue of the *Journal* we referred to the introduction by Messrs. McLellan & Smith, at their farm Cromdale, Makwiro, of a maize reaper and binder. The machine has been given a trial, and Messrs. McLellan & Smith now write us as follows:—"We have much pleasure in reporting that the work done by the mealie reaper and binder we got this year was very satisfactory. The machine runs very easily, and is a light load for six oxen, and the only repair we had was a bushing worn out through not being oiled—a mistake that will not occur again.

"There is no comparison in the lands reaped by the machine and ploughed early, and the lands reaped by hand



and the stalks grazed off and then ploughed. The early ploughed lands are in splendid tilth; you find moisture six inches from the surface, and the lands are ready for planting now. The late ploughed land is dried out, ploughed up in big chunks, and will not be ready for planting until it is thoroughly harrowed after the first rains.

“If our experience is any criterion, we think the Department can safely recommend the use of these machines by farmers. We will be pleased to give any further information if required.”

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CAPE WINES.—In September last year a representative collection of 16 different Cape wines was sent to the President of the Calwa Distributing Co., San Francisco, California, at the special request of his society. These wines included some of the Cape best light white and red wines, as well as some of the best sherries, ports and sweet wines. Only really good wines were sent, as they were intended to indicate the viticultural possibilities of the Cape, while at the same time illustrating the advances made in wine-making in the Cape during recent years. The wines that were sent were bought from wineries, farmers and wine merchants.

The Secretary of the Californian Grape Protective Association has submitted a report, of which the following are extracts:—“About thirty of the most representative wine men of California assembled at Jule’s Café, San Francisco, to sample the collection of South African wines which you were good enough to secure, some time ago, for Mr. Chas. F. Oldham (he is President of the Calwa Distributing Company).

“It was the general consensus of opinion that your wines, taken as a whole, were the best we have ever received from any country outside France and Germany. They shewed extraordinary merit and immense advancement over what we have seen of South African wines previously.”

Reporting on what was considered the best dry unfortified red wine, it is said that “it was a beautiful wine, soft and round, with a good bouquet and good colour.”

Of another red wine it was reported “it was most excellent, of true Burgundy character, but a little lacking in bouquet.”

About what was considered the best dry, unfortified white wine, the following was reported:—

“This was a very good, clean white wine, with a nice flavour, excellent bouquet of the German style—a really delightful wine.”

The Drakenstein was considered to be good, but a little hard and without much style.

“The sherries struck us as being particularly excellent. The best of these was the Kimberley Club Sherry, a charming dry wine of the Spanish type.” Some of the sherries were considered to be without marked character.

“Among the ports the Invalid Port of . . . was a light sweet wine, much liked; the F.C. Pontac Port . . . was a good dark wine.

“The Muscadel of . . . was an excellent type of wine with a strong muscadel flavour; much admired.”

Cape wines have been much maligned throughout South Africa, and the opinions quoted above will no doubt come as a surprise to many.

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**RAILWAY RATES FOR LIVE STOCK.**—The Rhodesia Railways, Ltd., notify that, in view of the very low rates for the conveyance of live stock over the Vryburg-Bulawayo section, they have decided that in the case of all live stock carried at concession rates, no less charges will be made than for four head large animals and eighteen small animals at full rates. This arrangement comes into force as from 1st January next.

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**MAIZE CONTRIBUTION TO IMPERIAL GOVERNMENT.**—The response to the appeal for maize to be offered by the farmers of this Territory as a free gift to the Imperial Government has been quite good, having regard to the many calls that have been made for other funds. Many farmers have, through their associations, given oxen, cows, heifers and small stock, in lieu of maize. These have been sold and maize purchased from the Co-operative Society with the proceeds. Other associations have given cash and maize, the maize in most cases having been sold locally and the equivalent supplied from Salisbury. This is done to avoid railage, which other-

wise would be a considerable item. The collection is not yet complete, but we hope to publish full particulars of the gift in our next issue.

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**THE TOBACCO GIFT.**—The fund which was started for the purpose of purchasing tobacco to manufacture and present to the Imperial troops fighting on the Continent has been very liberally supported, and it is hoped to be able to ship the first consignment Home in time for distribution amongst the troops at Christmas. This first consignment will consist of four million cigarettes in packets of ten each and 100,000 two ounce tins of Rhodesian smoking mixture for presentation to the troops, while 100,000 two ounce tins of Rhodesian navy cut leaf will be presented to the British Navy. Altogether some 40,000 lbs. of leaf is being used in the manufacture of the cigarettes and the tobacco, and the gift is typical of the splendid patriotism which prevails everywhere in this outpost of Empire.

The tobacco is being manufactured by Messrs. Hermann & Canard at Cape Town, the cost of manufacture being borne by the B.S.A. Company, who have also undertaken the distribution of the tobacco at Home. The tobacco has been conveyed to Cape Town by rail free of charge, while the Union-Castle Company are generously foregoing the sea freight to England.

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**STATISTICS.**—In the course of the preliminary work in connection with the putting into operation of the Agricultural Statistics Ordinance, it has been found that there are approximately 4,962 farms in Southern Rhodesia which have been either actually surveyed or, at least, demarcated for alienation, of which 2,044 are situated in Matabeleland and 2,918 in Mashonaland. Of these, there have been already alienated, or are in course of alienation, 1,280 in Matabeleland and 2,219 in Mashonaland, or 3,499 in all. The total number of farms that may be said to be beneficially occupied is 601 in Matabeleland and 1,169 in Mashonaland; but though, at first sight, the preponderance of occupied farms in Mashonaland seems startling, the discrepancy in proportion to the actual number alienated is not so out of the way. Whereas in Mashonaland



there are 52.68 per cent. of the alienated farms under beneficial occupation, the corresponding percentage in Matabeleland is 46.95. The subjoined table shews the position clearly:—

| Native districts.      | No. of farms surveyed or demarcated for alienation. | No. of farms alienated or in course of alienation. | Farms beneficially occupied. |                                |   |
|------------------------|---|--|------------------------------|--------------------------------|---|
|                        |   |  | No.                          | Percentage to total alienated. | Percentage to total available for alienation. |
| MATABELELAND—          |   |  |                              |                                |   |
| Bulawayo ...           | 102   | 77   | 44                           | 57.14                          | 43.14   |
| Insiza ...             | 258   | 152  | 67                           | 44.08                          | 26.00   |
| Umzingwane ...         | 64  | 55   | 26                           | 47.27                          | 40.62   |
| Matobo...              | 108   | 87   | 53                           | 60.92                          | 49.07   |
| Bulalima-Mangwe        | 263   | 192  | 111                          | 57.81                          | 42.20   |
| Bubi ...               | 181   | 106  | 46                           | 43.40                          | 25.41   |
| Nyamandhlovu ...       | 136   | 83   | 35                           | 42.17                          | 25.73   |
| Wankie...              | 153   | 48   | 26                           | 54.17                          | 17.00   |
| Sebungwe ...           | 3   | 3  | 3                            | 100.00                         | 100.00  |
| Gwelo ...              | 397   | 280  | 125                          | 44.64                          | 31.49   |
| Selukwe ...            | 123   | 83   | 25                           | 30.12                          | 20.33   |
| Gwanda ...             | 143   | 67   | 21                           | 31.34                          | 14.69   |
| Belingwe ...           | 113   | 47   | 19                           | 40.43                          | 16.81   |
| Total for Matabeleland | 2044  | 1280   | 601                          | 46.95                          | 29.40   |
| MASHONALAND—           |   |  |                              |                                |   |
| Charter ...            | 184   | 144  | 67                           | 46.53                          | 36.41   |
| Chilimanzi ...         | 101   | 90   | 50                           | 55.55                          | 49.50   |
| Hartley ...            | 444   | 320  | 195                          | 60.94                          | 43.92   |
| Melsetter ...          | 201   | 143  | 112                          | 78.32                          | 55.72   |
| Salisbury ...          | 283   | 262  | 127                          | 48.47                          | 44.87   |
| Lomagundi ...          | 282   | 172  | 100                          | 58.14                          | 35.46   |
| Darwin...              | 10  | 6  | 5                            | 83.33                          | 50.00   |
| Mazoe ...              | 303   | 240  | 147                          | 61.25                          | 48.51   |
| Marandellas ...        | 258   | 229  | 110                          | 48.03                          | 42.63   |
| Mrewa ...              | 42  | 37   | 19                           | 51.35                          | 45.24   |
| Mtoko ...              | 13  | 2  | 1                            | 50.00                          | 7.70  |
| Umtali ...             | 255   | 189  | 58                           | 30.69                          | 22.75   |
| Inyanga ...            | 86  | 72   | 23                           | 31.94                          | 26.74   |
| Makoni ...             | 213   | 154  | 60                           | 38.96                          | 28.17   |
| Victoria ...           | 148   | 114  | 63                           | 55.26                          | 42.56   |
| Gutu ...               | 56  | 25   | 17                           | 68.00                          | 30.36   |
| Ndanga ...             | 35  | 16   | 12                           | 75.00                          | 34.30   |
| Chibi ...              | 4   | 4  | 3                            | 75.00                          | 75.00   |
| Total for Mashonaland  | 2918  | 2219   | 1169                         | 52.68                          | 40.06   |
| SUMMARY—               |   |  |                              |                                |   |
| Matabeleland ...       | 2044  | 1280   | 601                          | 46.95                          | 29.40   |
| Mashonaland ...        | 2918  | 2219   | 1169                         | 52.68                          | 40.06   |
| Grand total ...        | 4962  | 3499   | 1770                         | 50.58                          | 35.67   |

It should be noted that, in reckoning the number of farms, cognisance has been taken of only those sub-divisions, in addition to the farms as originally surveyed, that have been officially registered as separate and distinct farms; the mere fact of two or more persons or families residing or squatting on a farm has not been accepted, in itself, as evidence that that farm has been split up into two or more distinct farms. Thus the number of farms here recorded as occupied represents only a fraction of the number of *bona fide* farmers in Rhodesia. In the Melssetter district, for instance, the number of farmers is probably at least double the number of occupied farms. Again, in reckoning the number of occupied farms no notice has been taken of those occupied by natives.

A very gratifying feature that has been observed in connection with this subject is the number of persons, originally and primarily connected with the mining industry, who have taken up—and are still taking up—land, either by purchase outright, or under permit of occupation, which they are farming either themselves or by proxy. This is distinctly a good sign; it shews that the gold extracted from the mines is not all leaving the country, and it also shews that there is abundant confidence in the agricultural future of the Territory.

## Export of Maize.

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By H. GODFREY MUNDY, F.L.S., Government Agriculturist  
and Botanist.

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In spite of what at one time appeared a most unfavourable season, the 1913-14 maize crop throughout the maize belt of Rhodesia did not fall much short of the normal production. In individual cases, owing to the uneven distribution of the rainfall, only very light yields were secured, but, speaking generally, results were better than could at first have been expected, and there has been found a considerable surplus of grain available for export. Owing to the outbreak of war, however, export from this country was for a time prohibited, and even when this restriction was removed, some difficulty was experienced in securing ship accommodation. These two facts combined have delayed export until unduly late in the season, and, unfortunately, to the disadvantage of Rhodesian shippers.

The first shipments of maize made some years ago by the Salisbury Farmers' Co-operative Society were graded in Rhodesia, but since then this work has been performed with sympathy and efficiency by the Mozambique Company's grader stationed in Beira. There were, however, several objections to grading at Beira instead of in Rhodesia, the most important of which was that there exists no local market in Beira to absorb maize unfit for export, and that, therefore, once at Beira all grades, no matter how inferior, must be shipped overseas. As far as is possible, Rhodesia should aim at *exporting* only her prime grades of maize, while utilising inferior grades for home consumption. The cost of exporting a bag of maize being alike for all grades, it is obvious that grades Nos. 1 and 2, which will command the highest price



on the European market, are the ones most profitable to export, and indeed when the world price of maize is low there may remain little or no profit in exporting inferior or damaged grain.

It was therefore considered imperative in the interests of Rhodesian maize growers that all grain intended for export should be subject to examination in Rhodesia prior to loading, and that on this examination the grades should be fixed. His Excellency the Governor of Mozambique concurred in these proposals, but it was agreed that Rhodesian maize should still be subject to port inspection by the Beira grader to prevent the shipment of weevilled or wet grain under clean certificate. The need for this second examination arose, firstly, from the expressed desire of the European Corn Exchanges for a *port* examination, and, secondly, from the possibility of maize becoming weevilled or excessively wet in transit from Rhodesia to the ship in which it is destined to be carried.

Investigations conducted by the Government Agricultural Chemist appear to indicate that if, for any reason, maize is held up for any length of time in Beira awaiting shipment, after the rains commence, it may absorb enough moisture to render it unfit for shipment. Similarly weevil may hatch out in the course of two or three weeks, and thus maize free from this pest when it leaves Salisbury may, owing to delay, become infested prior to loading at the port. The Beira grader's port examination, which only applies to the presence of weevil or excess of moisture, is therefore an additional safeguard to Rhodesian interests. The new grading regulations came into force at the beginning of November, and after this date all maize from Rhodesia going forward to Beira for shipment must be accompanied by a Rhodesian Government grade certificate.

As usual, the Salisbury Farmers' Co-operative Society, handling as they do so large a proportion of the total maize crop of this country, are among the parties most interested, and up to the date of writing (15th November) some 50,000 bags of grain have already gone forward for shipment, and it is understood that this will be followed by a further 50,000 bags at least. The Umtali Farmers' Co-operative Society also have exported approximately 10,000 bags. Of the Salisbury



Loading Maize for export, Salisbury.



Grading Maize for export, Salisbury.







Stacks of Maize for export, Salisbury.





Co-operative Society's shipment, some 38,000 bags were graded and passed in Salisbury, while many thousand bags were discarded as being below grades No. 1 or No. 2. Of the 38,000 bags, over four-fifths were grade No. 1, and only in a few instances, and these in the later consignments, was it necessary for the Beira grader to reverse the grades owing to the presence of weevil. Reference has already been made to export being unavoidably delayed too late in the season, and to this fact is attributable the presence of weevil in the stacks. Weevil invariably commences to hatch out in this country at the beginning of the rainy season, and had export been taken in hand earlier in the year, the bulk of the maize could have been got away before the pest made its appearance. It has also been said that many thousands of bags were discarded as being inferior to grades No. 1 or No. 2. In the great majority of cases this inferiority was not in the grain itself, but in the fact that the maize had been bagged while still wet, and had heated and moulded in the sacks. When this was so, weevil also had not infrequently made its appearance unduly early, owing to the unnatural conditions of heat and moisture. The presence of this damaged grain has proved a most serious difficulty to the officials of the Co-operative Society, owing to the increased handling necessary to separate it from sound grain, but finally it has been decided to export a considerable quantity under a "no grade" certificate. This is regrettable, but under the peculiar circumstances an unavoidable step. Were not the European prices for maize exceptionally high owing to the war, it is more than likely that export of this damaged grain would not be profitable.

In regard to the damaged and mouldy grain, this, although mixed in the stacks with sound grain, could almost invariably be traced to individual growers. Every member of the Society stamps his own number on each bag that he sends in, and whereas some numbers would consistently represent sound grain, others with equal consistency would be mouldy. A further fact of importance was that in the stacks such numbers would be mixed together, mouldy bags lying in close contact with those containing sound grain, yet in no instance could the writer detect with certainty that sound maize had been damaged through proximity to unsound. This fact seems



to prove conclusively that in the case of mouldy grain heating had commenced on the farm, and in many cases probably had run its course before ever the bags were built into the Society's large stacks adjoining the railway line. Several farmers have advanced the theory that the mouldy condition of the grain was due to seasonal causes preventing the proper maturing and drying out of the ears. To a certain extent this may have been the case, particularly with very late sown crops, but in the writer's opinion the power sheller is an even more potent factor. Under the old method of shelling with small machines the ears were husked in the field, and when dumped had ample time to dry out before being shelled. Nowadays, however, the large machines both husk and shell in one operation, and the ears not being husked when placed in the dump or crib have less opportunity of drying out. Again, should late rain fall on the dump prior to shelling the envelopes will absorb more moisture than would a husked ear, and this moisture is likely to be imparted to the grain by slow absorption.

The large percentage of mouldy grain this season can hardly fail to reduce the average selling price of our maize, and farmers should therefore be warned in time, and take particular care to avoid this evil next year. Provided our Rhodesian grain is dry and sound, and is exported sufficiently early to escape injury by weevil, we can confidently rely upon securing the highest prices ruling. On the other hand, carelessness in this respect will result in the loss of the good name which our maize has won for itself.

## Farmers' Tour.

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### THE TOBACCO QUESTION.

(An address given by Mr. J. H. FINCH before the Marandellas Farmers' Association, 7th November, 1914.)

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I propose to commence these addresses with the subject of tobacco, which, in the ordinary course, would have come near the end of the series, but in view of its importance to this district, I felt I should say what I have to about it before dealing with the tour in general.

The samples sent to me at Home going astray, I had to fall back on those forwarded by the Tobacco Warehouse at Salisbury. For certain reasons, however, I was only able on one occasion to exhibit my samples when interviewing manufacturers.

It is necessary here to explain the system of sampling. Firstly, no leaf is sold in London on samples submitted by sellers, so that all sampling done at the Warehouse for sending Home was for nothing. The practice is that the Port of London authority has an official sampler who opens every bale or package and takes a sample from the middle. Samples are marked and identified with the package exhibited in the bonded warehouse, where buyers see them. When a bale or hogshead is sold, the sample is returned to the package and sold with it. After the sale no question can be raised as to variation from sample.

As you know, the British South Africa Company have the selling of the leaf in their hands, so it was important to have their approval in anything I did. The British South Africa Company referred me to a London firm of tobacco brokers

whom they had employed to sell the leaf. These agents informed me that buyers were somewhat prejudiced against Rhodesian leaf through the ill-advised action of certain individual growers. They said representations had been made regarding our leaf that were not correct. Some growers had taken beautiful samples Home and sold quantities on the strength of these lovely samples, but when delivery was made the bulk was not anything like as good as the samples. I was told a lot more to the same effect, all of which went to shew what a bad lot Rhodesian growers were. At any rate, the agents offered strong opposition to my seeing the manufacturers, apparently fearing some action of mine would hamper the disposal of the consignment, though I did my best to explain my objects, and assure them that anything I did would rather help than hinder their negotiations. Under the circumstances, it was best not to act in any way to arouse the opposition or dissatisfaction of agents, or induce them to take less interest in selling the leaf, so I limited my efforts to gaining information that would be of value to growers. I wanted to find out how our leaf compared with that grown in Virginia; what kind of reception it would have on the English market, and, most important of all, what it would fetch. Unfortunately, no leaf had actually been sold up to the time I left. If I could have had another month at Home, in order to be present when the buyers were examining the leaf in the warehouse, I should have been able to get more definite information. As it was, the opinions expressed on various aspects differed considerably, and what I tell you are the average impressions I gained. Of course, when the importers are handling a new thing they are very cautious. In order to be on the safe side they would probably not say much in favour of the tobacco, and would probably offer less than its full value. In consequence of this cautious attitude, it is likely I heard all there was to be said against our leaf. On the other hand, the shortage in Virginia leaf and the rise in prices would make new sources of supply welcome, and induce importers to encourage competition in supply.

As to how our leaf compares with American grown product, it was complained that ours was deficient in body. One large manufacturer who has used it said its keeping qualities were poor. I found a tendency to confuse it with Nyasa leaf.



which, as far as I could see, is lacking in body, but taking all the American leaf I saw, I could not see that ours was inferior in body, or only in a small degree. It appeared, however, that the American leaf was of a better uniform colour than ours, and I saw no green or greenish leaf. As to poor keeping qualities, I could not help thinking, and told the manufacturer, that he had been unfortunate in having had a poor lot of leaf to deal with. Most experts called attention to the strong individuality of our leaf. They all admitted its specially good burning qualities, but they said its aroma is different from Virginia, and therefore it cannot be substituted. Most of us know our leaf has an aroma of its own, and in that respect we consider it better than Virginia. Still, when people are used to the Virginian flavour, a different one is noticeable and objectionable. As an objection on the part of manufacturers, however, I really do not think this of much account, because the quantity we can export is so small compared with American leaf imported to England, that the percentage of ours used in blending would not cause any noticeable difference to the smoker. So with regard to the various objections to our leaf I feel sure they can be disposed of.

You will notice that I assume our leaf must go on the British market on its merits, lose its individuality, and be used in place of so much American. I do not consider there is any use thinking of manufacturing and introducing it to the consumer as Rhodesian at the present time, as the quantity is too small—possibly barely enough for any one manufacturer who might agree to specialise in it—and any who did would require a guarantee for a continuous and increasing supply.

On the whole, I formed the opinion that our leaf would have a fair reception on the Home market. The manufacturers I saw were very interested to hear we were actually sending a good consignment and expressed a desire to test it. There is a constant demand for leaf of all kinds. It is imported from North and South America, China, Japan, East and West Indies, besides some European countries. Some is even grown in Great Britain and Ireland, but the amount is small and the quality poor.

Rhodesian tobacco on the whole has a fairly good name, and manufacturers are interested in it. The general prospect

with regard to its reception is, I think, fairly good, but you naturally want to know what prices it is going to fetch. It is not much comfort to us there being a sale for the leaf, unless the prices are payable.

Estimated values varied. Best Bright Virginia leaf was making up to 1s. 6d. a lb., and I did hear of higher figures than that. Of the Rhodesian leaf that was being sent to London, the best, if it were Virginia grown, would probably be worth 11d. to 1s. 2d., and for the other grades of bright and semi-bright anything from 6d. to 10d. Some of the darker grades, according to what I could learn, might not fetch more than 4d. The intention was to send only the best of the dark grades, and I am assuming that is what has been done. Whilst in Holland, I was told of a consignment of Rhodesian leaf having been sold at Amsterdam which fetched 21 cents. (4½d.) per lb. I tried hard while there, and later in London, to find out just what sort of stuff it was, but without avail; I only learnt it belonged to the Munga Co., and was informed that Amsterdam was the principal continental tobacco market. The price fetched was probably representative. The Rustenburg growers were also represented on the tour, and I learned that they had large surplus stocks of 1912-13 crops which they were trying to sell in England. For the finest quality of dark heavy leaf the price realised was 6d. at first, dropping later to 4d.

Probably you will be expecting me to give you some estimate of what the consignment will fetch on the average. I would really rather not give an estimate, for time at my disposal was too short, and my investigations were incomplete. As I said, I only had the samples to shew at one place, and I saw none sold, and my estimates must be largely in the nature of a guess. What I think is that as the market was three months ago we were then likely to get an average of 6d. to 8d. It all depends on the proportion of dark leaf sent. If we took only bright and semi-bright leaf into consideration, we might get an average of 8d. or possibly more. If, on the other hand, the proportion of dark leaf sent is large, it might bring the average of the whole down to 7d. or 6d. I give these figures with all reserve, and do not wish too much importance to be attached to them; they are merely my own opinions formed after incomplete investigation. For my own sake as



well as yours, I earnestly hope that the prices will be better than these. It is quite possible that an increased demand or decreased supply, or other unexpected causes, may operate in our favour. None was sold when I enquired last. The first lot arrived in July and the second in August. You probably know that the bales were packed in crates to prevent damage. On arrival there were no crates left. All were smashed, and they were placed in a corner of the warehouse as a heap of firewood. The tobacco was an unknown number of bales, having been consigned as a certain number of crates; some containing two and some three bales each. The number of bales sent was not advised, nor were the bales numbered or marked to shew the grade of leaf in them, so before anything else could be done each bale had to be opened and sampled, and when I enquired last the sampling was not completed. My estimate was therefore made before any leaf was actually sold, but as things were then I consider it pretty safe to take the figures I have given as a basis. I said it appeared to me we might expect to get an average of 6d. to 8d. for the leaf sent Home, and from that I proceeded to make an estimate of what the whole 1912-13 crop would fetch, and, taking into account the large quantity of poor quality leaf then on hand, I considered that the crop was likely to work out at something like 5d. per lb. net.

Now, if that is the approximate result to be expected in normal times, many growers will consider seriously if tobacco is worth growing at such a price. Some may decide it is not, but before such an attitude becomes general, it is well to ask if there is no other outlet or means of getting a price that will pay. I notice that growers have been receiving lots of advice as to what they should do in this crisis. Almost invariably they are told they should grow better stuff; grow fine leaf only and cure it bright; plant less and grow it better, and so on. It is one of the peculiarities of farming that those engaged in it are subject to advice from all quarters. It is astonishing the number of people you meet who appear to be competent to advise a farmer what to do in any circumstances, and the poor farmer has to listen meekly to it all. Advice of this kind is so free and abundant, that there is no need for me to repeat or to add to it. Of course I do not dispute that everything possible should be done to improve the quality of



our leaf. Our trouble is that the seasons and general conditions are such that it is impossible to cure out a crop without a considerable proportion of low grade stuff. What I want to suggest may be the means of getting a better average price: a suggestion that should have been exploited before this crisis arose. What we require is the entry into a market where our leaf has a preference, and if that were obtained, it would do much to infuse new life into the industry.

I made it my business to enquire into the possibilities of the Australian market, or rather to find out just how we stood in sending leaf there. You probably know the state of uncertainty there is about the matter. I have often tried to find out, but no one with whom I discussed it knew what our position was. It was supposed, or I gathered that by the letter of the Australian law, our leaf had a preference there, but the interpretation of the law by the Chief Controller of Customs was that manufactured tobacco was given a preference and raw leaf none, which was such an extraordinary state of things that one could understand. It seemed incredible that manufacturers in Australia should submit to manufactured tobacco being admitted at a more favourable rate than raw material required for their own industries.

There have been reports of parcels of leaf being sent to Australia to test the position, but I could never hear of any result. Well, as I said, I wanted to find just what was the position, so I went to the office of the Agent-General for the Commonwealth, and found that the tariff runs thus:—

Manufactured, 3s. 6d.; unmanufactured, 3s. 6d.

Manufactured and cut, 3s. 9d.; unmanufactured (S.A.), 2s. 6d.

Manufactured (S.A.), 2s. 6d.

Unstemmed and unmanufactured declared to be for purpose of being manufactured locally, 1s. 6d.

If stemmed only, and declared for local manufacture, 2s.

After the same has been manufactured, a further excise duty is imposed of 1s., or 9d. if hand-made. Though in two respects South Africa has the advantage of 1s., this is nullified

by *all* raw leaf, if declared for local manufacture, being admitted at a lower rate still, and there is no difference for South African leaf or any other. The position is quite plain. The law gives South African tobacco, both manufactured and unmanufactured, a preference of 1s. per lb., but American or any other leaf can get in, if accompanied by a declaration that it is for local manufacture, at 1s. 6d. plus 1s. excise after manufacture, so there is no inducement for Australian importers to get our leaf at 2s. 6d. duty when they can get American or any other by payment of 1s. 6d. duty down and 1s. later on. There we have the exact position, which is that we have no preference whatever, and yet the intention is evident. We can have no doubt that the intention was to give leaf from South Africa preference. The pity is that the real position was not known long ago, for growers surely would have taken steps in the matter. It was doubtless intended to allow South African leaf to enter at an advantage, and if that is the case, the question arises, could not something be done to get an alteration or re-adjustment of the tariff to give our leaf an actual advantage, as was intended? I discussed the question with the Chief of the Customs Department at the Agent-General's offices in London, and he informed me that an Inter-State Commission, whose duty it is to examine and enquire into the working of the tariff, is sitting at Melbourne, to receive petitions or recommendations as to alterations or amendments. This Inter-State Commission has to report to the Federal Parliament with its recommendations early next year, and it is expected that legislation will be introduced to carry them out.

Mr. Mulvaney (Chief of Customs) strongly recommended laying our case before the Commission, but said it was necessary that someone should appear to represent us in person. It immediately occurred to me that if Mr. Kempster was still in Australia, no one could represent us better, so I went to see the Manager of the Commercial Branch, who told me Mr. Kempster had returned to England. He pointed out that it was a matter for the Administration to take up, as it would carry more weight coming from the Government than from the British South Africa Company as a commercial company. With this I agreed, but still I think it is a pity this was not done while Mr. Kempster was there, as I feel sure his

personal representation of our case would have helped immensely. However, the question is, what to do now? Whatever is done should be done by the authority carrying most weight, *i.e.*, the Government, but, for reasons stated, it is necessary to act quickly. Being still in the Customs Union, I suppose representations would have to go through the Union Government. Probably the Commonwealth Government could not deal direct with the Rhodesian Government. I am stating the case as I found it, and think it should be for the Planters' Society and our local member of the Council to act in the matter if it is considered worth while.

This report is made as the result of my enquiries three months ago. Since then I understand there is a considerable change in the situation. I understand that the American and European crops are so short that we may get a much better return for our leaf than I have indicated. I have heard very exciting estimates of what American leaf now costs. Probably some of you are better informed in this respect than I. Any rise in prices to the paying level or above will be most welcome, as I consider the tobacco growing industry to be the most important feature of our agriculture. There is apparently no other crop to take the place of tobacco as a crop for the small man or the new-comer, and consequently no crop will have such an important bearing on the great problem of land settlement.



## Dhal or Pigeon-Pea.

(*CAJANUS INDICUS*.)

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By J. A. T. WALTERS, B.A., Assistant Government  
Agriculturist.

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Of the crops grown on the Government Experiment Farms during the last few seasons, none has attracted more attention than the dhal bean, an illustration of which at the period of its full growth accompanies this article. Applications for dhal seed are being received from all parts of the country, and where the crop has been grown, reports on it have almost unanimously been gratifying.

The dhal bean is an introduction to Rhodesia from India. In the latter country it is extensively grown both for the beans (which are used as food for man and beast), and for the foliage (which is fed to stock). There is every probability, however, that the plant is indigenous to Central Africa, a fact which may account for its ready adaptability to Rhodesian conditions. There are several varieties of this plant, one of which, *Cajanus bicolor*, has been tried at Salisbury with success. It differs from the ordinary variety in having mottled seed, and in being slower in growth. It would seem, however, to be distinctly superior as a drought-resister, and for this reason is being propagated with a view to distribution later.

The dhal plant makes rapid growth after germination, and finally attains a height of six or seven feet at maturity. It branches freely, and soon becomes profusely covered with leaf growth and yellow flowers. The pods require a full season to ripen seed, and for this reason it is necessary to sow dhal early to obtain a maximum yield of grain, though it may be sown as late as February if only a winter pasture is required.

Dhal is a perennial plant, continuing to grow and to bear freely for several seasons. It easily withstands the winter temperatures obtaining at Salisbury, although some farmers in colder localities have reported a slight touching by frost, from which, however, the plants soon seem to recover. It is undoubtedly advisable never to sow in vleis or low-lying lands that are liable to sharp attacks of frost. The root system consists of a strong main tap root which penetrates deeply into the soil, and lateral rootlets often covered with nodules. The plant may be cut a foot or so above ground without suffering any injury. New shoots spring up almost immediately, and these remain green throughout the winter, affording a fair amount of valuable winter pasture after the summer crop of beans has been harvested. The beans are borne in pods, each pod containing three or four seeds. When thoroughly ripe and dry, the pods burst readily and shed their seeds freely. This feature, which enables the crop to be harvested so easily, is an advantage that dhal possesses over most of the cultivated leguminous crops.

The need of a leguminous grain crop as a constituent of the ration to be fed to all farm animals has been repeatedly pointed out by writers on the feeding of stock. The soy bean, cow-pea and haricot bean have not up to now proved entirely satisfactory for one reason or another in Rhodesia. It would seem, however, that in dhal we have a leguminous grain that is at once hardy against insect pests, high yielding and perennial. The following analysis of the dhal bean given by Church in his "Food-grains of India" shews its high albuminoid content. An analysis of the cow-pea (*Vigna catjang*) as given by Bailey is also added for comparison:—

|               | Dhal.          | Cow-pea.       |
|---------------|----------------|----------------|
| Water ... ..  | 10.5 per cent. | 14.8 per cent. |
| Albuminoids   | 22.3 per cent. | 20.8 per cent. |
| Starch ... .. | 60.9 per cent. | 55.7 per cent. |
| Fat ... ..    | 2.1 per cent.  | 1.4 per cent.  |
| Fibre ... ..  | 1.2 per cent.  | 4.1 per cent.  |
| Ash ... ..    | 3.0 per cent.  | 3.2 per cent.  |

The nutritive ratio of dhal is therefore 1:3.

In addition to the value of the dry beans mentioned above, the following quotation from Watt's "Commercial Products of India" shews to what varied uses the plant may be put:—





Dhal (*Cajanus indicus*) at period of full maturity. Botanical Experiment Station, Salisbury.



Dhal, October, 1914. Winter growth after crop of beans had been removed in July, 1914, by cutting the stalks to about 12 inches above ground.





“Dhal cultivation has been commended for all tropical countries on account of the green peas it affords being an excellent substitute for the common garden pea, and it comes into season during the hot months when the ordinary pea is not available. . . . In India it is most frequently grown as a mixed crop, and more particularly as a rotation crop for cereals. . . . If grown alone on good soil, the yield may be 2,000 lbs. per acre. . . . It is one of the best leguminous restorative plants known to the Indian agriculturist. The leaves form a valuable fodder, and occasionally a pruning of the young shoots is taken and given to cattle.”

This last plan might advantageously be adopted in Rhodesia during the winter months as a means of feeding stall-fed dairy cows or valuable calves. It is not known whether a too liberal allowance would cause bloat or hoven, as in the case of lucerne or clover, but with a little attention this can easily be avoided.

Dhal should be sown in drills 3 feet to 3 feet 6 inches apart, each seed being 9 to 12 inches apart in the row. A maize planter with plates adjusted for dhal seed would be admirable for this purpose. Sowing should be done about the middle of December or even earlier if the rains permit. The crop will then be ready for harvesting about the middle of June. The plan adopted for harvesting on the Government Experiment Farms has been to cut the plants off at maturity about 12 inches above the ground, then to allow them to dry thoroughly on a clean floor made of a sail-cloth or sheets of corrugated iron. After a few days a slight shaking will release the beans from the pods, and the grain can then be winnowed clean. The dried leaves and pods remaining can profitably be fed to stock, a slight damping being all that is necessary to render them exceedingly palatable.

The yield of grain obtained at Salisbury from a plot sown in December, 1912, was at the rate of 1,350 lbs. of seed per acre in 1913, and 1,210 lbs. per acre in 1914. During the intervening dry months considerable green growth was made, and the illustration shews the plot as it appeared in October, 1914. It must, however, not be forgotten that a systematic grazing of the green dhal shoots during the winter months is likely to detract from the yield of beans the following season.

On poor sand soil at the Longila Experiment Farm, Lochard, a yield of three bags of beans per acre was obtained in the first year (1913-14) with a total rainfall of only 14 inches. It has been suggested that a mixture of dhal and Napier's fodder would provide an excellent spring pasture mixture, the Napier's fodder being cut for ensilage in April and the dhal cut in June. The writer does not know of this having yet been tried, but there seems to be no reason why it should not be successful.

The importance and possibility of dhal, as a Rhodesian crop will be obvious from the above remarks. The freedom from severe frosts which prevails almost over the whole country marks the climatic conditions as being suitable; while the high yields of extremely nutritious beans make it of great value for the feeding of stock. Add to this the possibility of obtaining a considerable quantity of green winter feeding, and it will be evident that the crop is one which deserves the careful attention of every farmer.



## Citrus Fruits in Rhodesia.

By A. G. TURNER, Citrus Expert.

In selecting a site for a citrus orchard, there are some points that must be carefully considered—transportation facilities, susceptibility of the farm to damaging frosts, suitability of the soil, availability of a perpetual water supply for irrigation and protection from prevailing winds. It is not advisable to plant citrus fruits far from railway lines, as wagon transport is slow and expensive, and, moreover, the pack will be ruined unless the wagon is very well sprung and the road is good. With regard to frost damage, one is fairly safe if there is no likelihood of more than 8 or 9 degrees, provided the orchard is naturally well protected from winds. If not, wind-breaks should be planted before the orchard is laid down.

Probably the first operation on the land will be to clear it of native trees and bush, which must be done thoroughly, leaving no stumps, etc. Suitable soils will be found in red soils, sandy loams and the lighter chocolate loams, provided they are deep and have not clay or ironstone sub-soils; also deep black granite and some lighter grey soils. Turf and clay soils are unsuitable, and should not be considered. Whatever the soil is, good drainage is a *sine qua non*, as the orange, like most other fruit trees, must have dry feet. While it requires a plentiful supply of water, it is certain death if there is any possibility of stagnant water.

It must be remembered that the citrus tree is an evergreen, and consequently requires water right through the year to make satisfactory growth of wood and fruit. It should be borne in mind that citrus trees require more water than deciduous trees of equal size and age, which latter shed their leaves; therefore, transpiration is greatly reduced at this season, whereas the leaf area of citrus trees is the same in

winter as in summer, so that a like amount of water is transpired all the year round. When citrus trees receive an inadequate amount of water they do not make a normal growth, but wilt and shew signs of distress generally. The young fruit falls off, and what is brought to maturity is fairly certain to be deficient in juice and of poor quality. To have trees in such a condition is simply inviting the attacks of fungus diseases, scale, insects and any other kind of pests.

I may remark here that although I have only been in Rhodesia a few weeks, I am convinced that irrigation is just as necessary in this country as it is in the Union of South Africa; more particularly the Transvaal, where I have had considerable experience of the absolute necessity of an adequate supply of water for irrigating citrus fruits. Without this, it has been proved to be useless to commence a commercial citrus undertaking; and, further, from what I have actually seen whilst inspecting citrus farms in the Mazoe, Umtali, Marandellas, Hartley and Salisbury districts, the same conditions apply here.

Oranges raised in Rhodesia without irrigation are practically certain to be delayed in their growth, and consequently blooming will not occur until the rains commence. A crop of out-of-season fruit will be set, which is of little or no value even for local markets, and of none at all for export to European markets, which must be the ultimate goal of the bulk of Rhodesian-grown oranges. The trees will no doubt have endeavoured to bloom at the right time, viz., in August, and even have set a small crop of oranges, which are likely to contain plenty of wind and rag under a thick rind. If there is one thing more sure than another in citrus growing, it is that there is no money in a tree that is subjected to any unnecessary hardship and want of a drink at the right time.

I would remark right now that I consider it is so much waste of time and money to lay out a citrus orchard without facilities for irrigation, even assuming there is an annual rainfall of 35 inches during the wet season, say from October to April; this leaves a most important period in the annual life of the tree without a supply of water. If the 35 or 40 inches were evenly distributed throughout the year that should prove sufficient, but as we are not able to control the elements at will, we must make use of artificial application. It is

possible to raise an orange tree, of a sort, without irrigation up to the time of bearing, although it will not be the tree it would have been had it been irrigated at the proper time. It would then throw out its most vigorous growth at the right season of the year, *i.e.*, July to August, but when the tree reaches bearing age it appears to me to be common sense that a fruit which consists mainly of water cannot be raised unless it receives water at the right time and just when it wants it. Undoubtedly an orange tree will produce fruit here on the annual Rhodesian rainfall, but not sufficiently so to make it a satisfactory commercial undertaking.

When the land has been thoroughly cleared of timber and bush it should be ploughed very thoroughly, and if the sub-soil is inclined to be stiff it must be sub-soiled, but this would not be necessary in the lighter loams. Then a harrow and cultivator should follow until the land is perfectly worked up and level, as, if the grove is planted in an uneven condition, it will prove to be a considerable nuisance in after years, and will interfere with all kinds of cultivation and irrigation among the trees.

Before commencing to prepare the land for citrus planting, make sure by actual test or thorough survey that water can be led all over the land under consideration; if this is impossible, grade the land so that water can be successfully led to every tree. The ideal grading is when irrigation can be performed from two sides of the orchard; in this way irrigations can be applied from these two sides, turn about.

The orange *can* be transplanted at any time of the year under favourable conditions, but usually the best time for this operation is after it has hardened up the first growth, and before the second commences, which usually coincides with the beginning of the wet season, *i.e.*, end of October or early in November, as by planting at this time when the ground is warm the tree is quickly established and commences to grow right away, and by the end of the growing season should have put on considerable growth. If an orange tree is planted in winter it remains without growing until the spring, but has to be irrigated all this time, and one planted later than January is likely to continue growing so late that it may get nipped by cold.

*(To be continued.)*



## Chafer Beetles.

By RUPERT W. JACK, F.E.S., Government Entomologist.

The name "chafer" is of the same derivation as the modern German word "kafer," meaning a beetle. The South African Dutch have a similar word "keever," which is applied to certain kinds of beetles, notably to some closely allied to those rightly included under the description of chafer beetles in English. These beetles are members of the great *Scarab* family, which includes the well-known dung-rollers, a species of which is the famous *Scarabaeus* held sacred by the ancient Egyptians. The dung-rollers and their closer allies are not, however, rightly named chafers as the term is used. The name should be restricted to those members of the family which as beetles feed upon the foliage, flowers and fruit of plants. A familiar example to these from the Old Country is the cock-chafer so abundant in the British Isles in the spring. In Southern Rhodesia the bluff rounded beetles that blunder into lighted rooms during the warm evenings in October and November are familiar to all, and are typical representatives of the chafer beetles.

There is a noteworthy uniformity of habit amongst related members of this family, so that it is possible to divide the chafers into two headings, namely, the night-flying chafers and the day-flying chafers, a division that is also a natural one as regards the relationships of the beetles themselves.

The night-flying chafers are generally sober in colouring, exhibiting mostly various shades of brown. In the main they are leaf-eaters, and are responsible for the fretting and destruction of the leaves of peach, apricot, grape vine, etc., during the short period of their abundance. They fly mostly up to nine o'clock of a night, and are little in evidence after this hour. They may be seen in great numbers as dusk draws in, buzzing around the trees they favour. (Figs. 1 to 6 on Plate I. include beetles of this division.)



1.



2.



3.



4.



5.



6.



7.



8.



9.



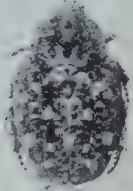
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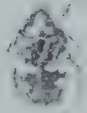
12.



13.



14.



15.



16.

Plate No. I.





The day-flying chafers are generally of a more pronounced colouring than the night-fliers, and many are ornamented with very bright colours, some, indeed, being amongst the most gaudy of beetles. The beetles represented from Figs. 7 to 16 on Plate I. belong to this division, but the camera does scant justice to their markings. These beetles are mainly fruit and flower eaters, but some species will also eat foliage.

It is an unfortunate fact that the camera, whilst reproducing the form and size of an object accurately, is apt to fail woefully in regard to the value of the colours, even though the most modern methods be employed. On this account Plate I. is not as instructive as could be wished. In the explanation of the plates at the end of this article, however, the colours of the beetles portrayed have been indicated, and it is hoped that in the majority of cases this will enable the beetles to be recognised. Southern Rhodesia is very rich, if the horticultural reader will forgive the adjective, in varieties of chafer beetles, and only a few of the commoner forms have been depicted. These may be considered representative.

Except in the case of very conspicuous species, it is extremely difficult to invent English names sufficiently succinct and descriptive to be of any value for insects of this description, and as the use of Latin names carries a suggestion of technicality which it is desired to avoid, the reader is asked to refer to the beetles by their numbers on the plate. Of the night-fliers, none except No. 5 exhibit any marked peculiarity of habit. All the species have been taken in numbers on peach, apricot, apple and rose, as well as wild trees and bushes. The leaves are fretted in a very characteristic manner, as may be seen by reference to Plate II., Fig. 1, which shews the work of the species at Fig. 1 on apple leaves. The zig-zag cuts are indicative of chafer injury, no other insect being known to work in quite the same way. The beetle shewn at Fig. 5 is worth special mention, because it is the greyish brown chafer that does so much damage to rose bushes at Salisbury and elsewhere. When rose leaves are fretted and no enemy can be seen, a little searching in the soil under the bushes in day time will usually reveal this species in numbers.

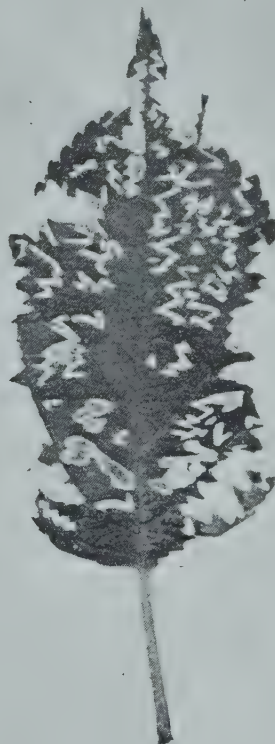
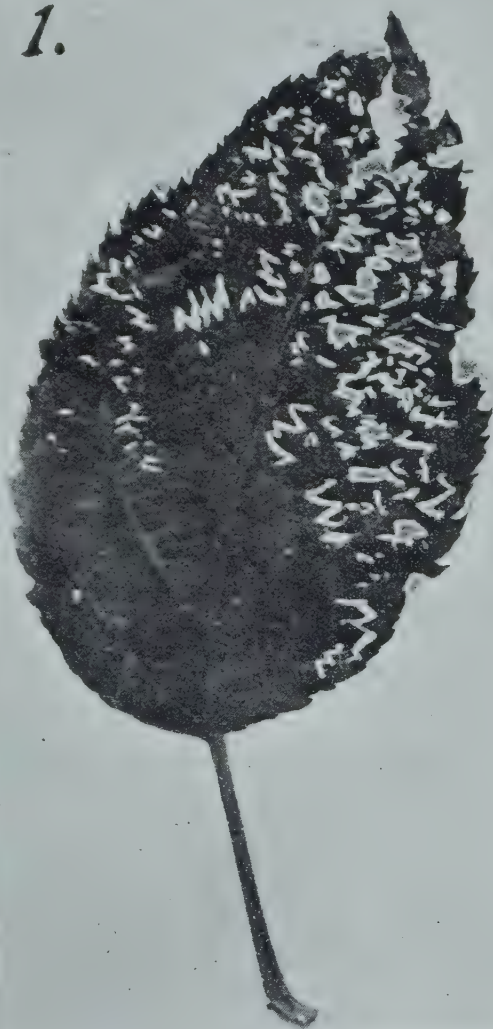
As far as is known, the breeding habits of all the night-flying chafers are similar. No species has been bred through

in Southern Rhodesia as yet, and it is only possible, therefore, to give the experience of investigators in other parts of the world. The eggs, which are smooth and white, are laid singly and loosely in the soil during the short flying period of the adults. In this country the bulk of the egg-laying will probably be in October to November. The eggs hatch in a few days. The grub is of the form shewn at Plate III., Fig. 1, and feeds on the roots of plants. These grubs are known as "white grubs" and constitute a serious entomological problem in many parts of the world, including Southern Rhodesia. The time taken by the grubs to complete their growth varies with the species. In the cooler climates, a common species takes two to three years, whilst the same species further north still is supposed to take up to five years. It is doubtful whether in the warmer belt of the earth any species takes so long; in fact, it is possible that all the species portrayed complete their growth in one season. In India a close relation to No. 4, namely, *Anomala varians*, has been bred through in an insectary, and the grubs were found to feed for about four months. They then rested in specially constructed cells in the earth for about six months, pupated, and the beetles emerged in a few weeks. A similar life history in Southern Rhodesia would be for the grubs to feed from December to March, to rest from March to September, pupate, and for the beetles to emerge in October to November. The grubs of such beetles have been commonly found resting in cells in the earth in the winter in this Territory, and it can, therefore, be inferred that certain species have a similar life history to that outlined. The beetle shewn at Fig. 1, however, changes to an adult and rests in the earth for several months before it takes to wing. This habit is also paralleled by species studied in India and elsewhere. Notes of this nature may seem a little academical to the ordinary reader, but they have frequently an important bearing on repressive measures, and it is desirable that more should be learnt about the breeding habits of our injurious species.

Of the day-flying chafers, the species shewn at Fig. 7 on the plate is by far the commonest and most injurious. This is the conspicuous dark green and yellow beetle which swarms on the peaches, apricots, plums and apples during favourable years and does a very great deal of damage. It is no un-



1.



2.

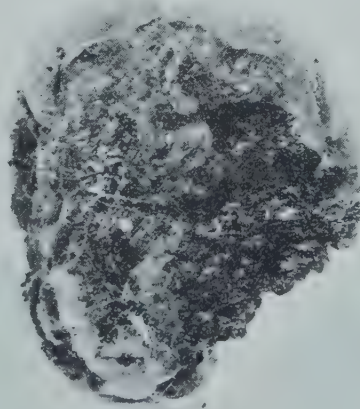
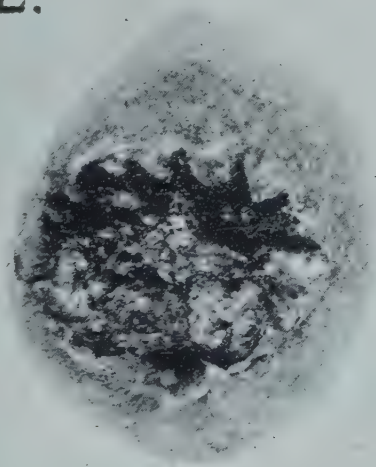


Plate No. II.





common sight to see up to a score on one peach, which, needless to say, is speedily demolished *in toto*. Injured peaches are shewn at Plate II., Fig. 2. The amount of damage done in small orchards is frequently overwhelming. Besides attacking fruits, this species has been observed in great numbers in rose gardens demolishing the blooms. It will also devour vine leaves freely. The remainder of the day-fliers, with the exception of No. 16, are of fruit and flower-eating habits, and are commonly taken in company with No. 7. No. 16 is the green and red beetle generally known as the rose chafer, which buries itself in rose and other blossoms, to their detriment. It is very common in the Public Gardens at Bulawayo amongst other places.

The breeding habits of the day-flying chafers are by no means so uniform and simple as those of the night-fliers. We have no information concerning our native species, except in connection with the beetle shewn at Fig. 11, the pupal chamber of which was found by Mr. R. H. Thomas of Gatooma in thatch under circumstances that suggest that the grubs had been feeding on the decaying grass. Elsewhere the grubs, which are of similar form to the grubs of other members of the family, have been found in ants' nests, in rotten wood and decaying vegetable matter, whilst some are known to feed on the roots of plants. It is supposed that some South African species are associated with Termites (White Ants), but there is a wide field for investigation in connection with the life histories of this sub-family.

INJURY DUE TO CHAFERS.—The damage inflicted by chafer beetles may be summed up as follows:—

- (1) Destruction of foliage.
- (2) Destruction of fruit.
- (3) Destruction of blossom.
- (4) Destruction of roots.

Although the beetles are very fond of the leaves of cultivated fruit trees, etc., they commonly feed in great numbers upon those of native trees even in the vicinity of orchards. The proximity of native trees, such as the Msasa (*Brachystegia Randii*) and others, serves, therefore, in some degree as a protection. Fruit trees are sometimes, however, completely stripped, though generally the defoliation is only partial.

The foliage removed by the beetles has to be replaced by the tree, and the yearly removal of part of the first leaves re-acts deleteriously on the vitality of the tree. Trees which are completely stripped several years in succession may die out altogether. Commercial fruit-growers and garden lovers will do well, therefore, to take measures to protect their trees from injury, even if the damage each year does not appear to be very serious.

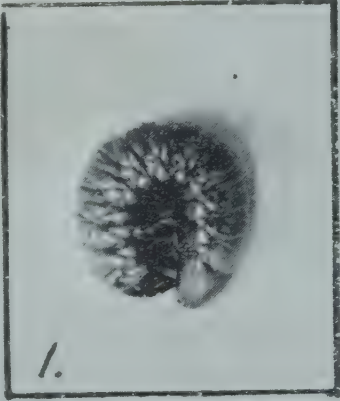
The damage done by the fruit-eating species is the most conspicuous of all, and unfortunately we can fight them less effectively than the leaf-eaters. Fifty per cent. and more of the fruit in many orchards and gardens was injured or destroyed by these beetles about Salisbury last spring, some gardeners complaining, in fact, that practically all their fruit was taken. Last season was, however, exceptionally favourable to the beetles, which vary considerably in numbers from year to year.

Injury to blossom mainly takes the form of destruction of ornamental flowers, such as roses, but fruit trees which blossom late are apt to suffer, the beetles eating off the petals and stamens, and so preventing the setting of fruit. This form of injury might easily be overlooked. Luckily most of the common fruit trees have set fruit before the beetles are on the wing.

The root-feeding grubs are in many species far more injurious than the beetles, as they attack crops, pastures, tree roots, etc., very freely. Certain species are very injurious to maize in favourable situations, notably in rich valleys. Small grains also suffer very severely, the roots frequently being eaten off entirely. To permanent pastures in the north temperate regions no insects are more injurious than white grubs, and in limited plantings in Southern Rhodesia our native species have from time to time shewn a capacity for serious damage. When permanent pastures become a feature of farming operations in this Territory, white grubs are likely to make their presence felt.

**REMEDIAL MEASURES.**—Against the nocturnal leaf-eating species an effective protection appears to be spraying with arsenate of lead. In other countries this has been reported as deterring the beetles from attacking foliage, and a few tests made in this country have borne this out. Arsenate of lead is





2.



Plate No. III.



usually used for the purpose of poisoning leaf-eating insects, but it is obvious that with insects which occur in such swarms as the chafers, but little protection would be given to foliage if each beetle had to eat sufficient poisoned leaf to kill it before its capacity for damage was at an end. The beetles' distaste for this compound, however, renders spraying a very useful practice. A strength of three pounds to fifty gallons of water is recommended.

The strong attraction that light has for these insects suggests that some sort of a light trap might be of advantage as an addition to other methods in the field, though such a method cannot be relied upon by itself. Light traps have on the whole fallen rather into disfavour of recent years. They have the great disadvantage of being indiscriminate in the kind of insects attracted, many useful insects falling victims in addition to injurious species. When the chafers are on the wing, however, they outnumber many times over all other species of insects attracted to light, and they come in great numbers. One party in the Territory who tried a trap reported great slaughter of beetles, but finally abandoned it because no diminution of the attack on the trees was noticeable. It should be remembered, however, that the attractive distance of a light is limited, and the more traps there are within reason the greater the numbers of beetles that will be destroyed. Light traps have the great advantage of involving but little labour and carrying on their work whilst the orchardist is otherwise engaged.

A simple form of lantern trap is shewn on Plate III., Fig. 2. The tub should contain water with a film of paraffin oil on the surface. Beetles blundering against the light fall into the tub, the paraffin causing speedy death. The white light of acetylene is more attractive than a yellow paraffin light, and the miners' lamps used in this Territory may be turned to good account in this connection. Light traps at best can, however, only be regarded as an auxiliary measure.

Another method of dealing with night-flying chafers much employed in France is to shake them from the trees at night on to sheets spread beneath, whence they are collected and destroyed. Millions of chafers have been destroyed annually in this way. As has been stated, the chafers fly



up to about 9 p.m. in this Territory, after which hour they settle down to feed, and drop at once when disturbed. They can be destroyed by throwing them into a pail with water and paraffin as used in the light traps.

In rose gardens some benefit will be derived by keeping the soil beneath the bushes loose and turning in fowls. The small chafer at Fig. 5, which hides in the earth beneath the bushes by day, is very acceptable to fowls, which will scratch in the loose earth and devour large numbers.

For the day-flying chafers no remedy is known except destruction by more or less manual methods. Fortunately the beetles have a habit of collecting in great slumps on the fruit, and this facilitates the work of destruction. The early morning is the best time for operations, as the beetles become very lively and take wing too readily in the heat of the day. A paraffin tin should be charged with a little water with a film of paraffin on the surface. This is to be introduced quietly under a clump of beetles, when a sharp jar to the branch will bring them tumbling into the tin. Loose beetles may be picked off by hand. By systematic work it will be found that a great decrease in numbers can be brought about, especially in isolated orchards. The beetles are so big and do so much damage individually that the tendency is to over-estimate their numbers.

Mr. C. W. Howard, formerly Entomologist to the Transvaal, states that he found that fruit sprayed with a plain wash of lime was never attacked by fruit-eating beetles. This is worth a trial.

Experiments with poisoned bait against the fruit-eating species have up to the present given negative results, no lure being found more potent than ripening fruit.

Against "white grubs" there is at present no method which has been tested in this Territory; in fact, it may be said that a really satisfactory remedy is still wanted everywhere. In North America a frequent rotation of crops is practised, as it is found that permanent pastures are apt to become badly infested. Deep ploughing and thorough harrowing in the autumn is a method of destruction. This is done with a view to breaking up and destroying the winter cells as much as possible, and thus exposing the grubs or beetles to atmospheric changes, as well as burying and crushing them.

Swine are also turned into badly infested lands, which they will root up all over in quest of the grubs, of which they are very fond. Early ploughing and thorough cultivation during the winter will probably be the best remedy for "white grubs" in Southern Rhodesia.

### EXPLANATION OF PLATES.

Plate I. Fig. 1. *Schizonycha puncticollis*—Colour reddish brown.

Plate I. Fig. 2. *Schizonycha infantilis*—Colour yellowish brown.

Plate I. Fig. 3. *Anomala pinguis*—Colour reddish brown with black streaks on wing covers.

Plate I. Fig. 4. *Anomala pallida*—Colour light yellowish brown.

Plate I. Fig. 5. *Adoretus testaceus*—Colour dark brown covered with fine light hairs.

Plate I. Fig. 6. *Adoretus picticollis*—Colour yellowish brown with black markings on wing covers and thorax.

Plate I. Fig. 7. *Pachnoda impressa*—Colour dark green and yellow.

Plate I. Fig. 8. *Pachnoda flaviventris*—Colour dark green and yellow.

Plate I. Fig. 9. *Pachnoda rufa*—Colour rufous.

Plate I. Fig. 10. *Rhabdotis sobrina*—Colour chocolate brown and white.

Plate I. Fig. 11. *Diplognatha gagates*—Colour black.

Plate I. Fig. 12. *Tephraea dichroa*—Colour wing covers purple brown, thorax dull yellow with two dark spots.

Plate I. Fig. 13. *Protætia carneola*—Colour bright yellowish brown with darker brown spots.

Plate I. Fig. 14. *Tsandula africana*—Colour bright metallic green.

Plate I. Fig. 15. *Leptothyrea* sp.—Colour black and white.

Plate I. Fig. 16. *Leucoscelis* sp.—Colour wing covers metallic green, thorax, etc., red.

Plate II. Fig. 1. Apple leaves fretted by *Schizonycha puncticollis*—observe characteristic zig-zag nature of cuts.

Plate II. Fig. 2. Peaches destroyed by *Pachnoda impressa*.

Plate III. Fig. 1. Chafer grubs—"White grubs."

Plate III. Fig. 2. Suggestion for a light trap.

## Maize Experiments, Gwebi Experiment Farm, 1914.

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By H. GODFREY MUNDY, F.L.S., Government Agriculturist  
and Botanist.

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In addition to the maize manurial trials reported upon by the Agricultural Chemist in the August issue of this *Journal*, numerous other experiments with maize were carried out on the Gwebi Experiment Farm during the past season. It is thought that by publishing some of the results of these at once, without awaiting the confirmation of subsequent years, useful information may be placed in the hands of farmers prior to this year's seeding. All the following trials were conducted on red soil, that on which Salisbury White maize was planted being more fertile than that sown to Hickory King.

### SALISBURY WHITE MAIZE.

(A)—The first plot consisted of land to which no manure has ever been applied. The sequence of cropping was as follows:—Maize, 1909-10; pumpkins, 1910-11; maize, 1911-12; wheat, 1912-13; maize, 1913-14. The preparatory tillage operations were as follows:—Disc ploughed, disc harrowed, clod crushed and spike harrowed twice. Seed was sown 24th November, and, where germination failed, misses were filled in by hand about 8th December. The subsequent cultivations were two harrowings, two horse hoeings and hand scuffled; suckers removed once. The crop was reaped 12th July, and the yield was  $13\frac{3}{4}$  bags per acre, or 10,950 lbs. from the four acres.

(B)—Ten acres of similar land, fifth year under crop, were treated in exactly the same manner, except for an appli-



cation of 35 lbs. nitrate of soda, 65 lbs. double superphosphate and 25 lbs. sulphate of potash per acre broadcasted and harrowed in the day before seeding. The acre return was slightly more than  $16\frac{3}{4}$  bags, or an increase of 3 bags per acre over the unmanured land adjoining. The cost of this dressing was 20s., and it therefore gave a small profit the first season, while, judging by the other trials already reported, the residual value of the fertiliser will be apparent and prove profitable in the second and even perhaps in the third year also.

(C)—A further ten acres in the same block, fifth year under crop, but grading off into less fertile soil, and including two acres of new land cropped for the first time, was dressed broadcast with 100 lbs. per acre of Rhodesian Maize Fertiliser, costing 12s. on the farm. In all other respects the treatment of the land and crop was exactly the same as in the two previous trials. The yield here was 13 1-10th bags per acre. The apparent failure of the Rhodesian Maize Fertiliser to effect an increase in crop is misleading. The land was naturally less fertile than in Block A, and was further handicapped by the two acres of new ground, since experience has shewn that artificial fertilisers do not usually shew to advantage on first year land. Taking these two factors into consideration, the increased crop due to the use of fertilisers may probably be estimated at 2 to 3 bags per acre.

(D)—This plot consisted of ten acres of second year land which in the first season grew part oats and part linseed. Preparatory cultivation comprised ploughing with a two-furrow mouldboard plough followed by the disc harrow and clod crusher. The land was then cross-ploughed with the disc plough, disc harrowed and spike harrowed. Seed was planted 26th November and misses filled in by hand on 6th to 8th December. Thereafter it was harrowed twice, horse-hoed twice, and once scuffled and suckered by hand. The yield was slightly over 12 bags per acre.

The total area under Salisbury White maize was 63 acres, of which 14 acres were fertilised in 1911 and 20 acres in 1913. The average yield over the whole field was  $12\frac{1}{2}$  bags per acre, as against 10 bags per acre the previous year. In these experiments no result is more striking than the return of  $13\frac{1}{2}$  bags

per acre on unmanured land carrying its fifth crop. This return, which is the heaviest yet obtained from the land, seems to be, at least in part, due to the previous year's crop of wheat, the stubble of which, by being ploughed under, not only increased the soil's supply of organic matter, but also improved the mechanical condition, thereby facilitating the preparation of a good seed bed. It is of primary importance to know that by means of rotation and *good tillage* our crop returns from the red soils can be maintained in this manner.

#### HICKORY KING MAIZE (Ten Row).

(E)—In this series of experiments, the object was to ascertain the relative advantages, if any, of ploughing with a mouldboard plough as against a disc plough and of sub-soiling. The land chosen had been under crop for seven years, and until this season had never received any manurial treatment. It is not naturally fertile soil, and during the last four seasons the average yield has been about 3 to 5 bags per acre. In this instance two seasons' results are recorded, the land receiving identical treatment each year.

Each plot was ploughed once, spike harrowed, clod crushed and spike harrowed again, to prepare a seed bed. Seed was planted during the first week in December, and the land was four times cultivated, and twice scuffled by hand and suckered. The returns in 1912-13 were: (1) eight acres ploughed with a 3-furrow disc plough,  $5\frac{1}{4}$  bags per acre; (2) four acres ploughed with a 2-furrow mouldboard plough,  $3\frac{1}{4}$  bags per acre; (3) four acres ploughed with a single-furrow mouldboard, and sub-soiled with a skeleton sub-soil plough,  $5\frac{3}{4}$  bags per acre.

As stated, the experiment was continued in 1913-14 on the same land, and with exactly the same treatment, except that 150 lbs. per acre of Rhodesian Maize Fertiliser, costing 18s. on the farm, was broadcasted and harrowed in the day before seeding. The yields were:—(1) 7 5-8ths bags per acre, (2)  $6\frac{1}{4}$  bags per acre, (3)  $8\frac{1}{2}$  bags per acre.

It will be seen that here again the use of the artificial fertiliser increased the crop, when compared with that of 1912-13, by approximately  $2\frac{1}{2}$  to 3 bags per acre in the first



year of application. Further, that sub-soiling gave a slightly increased yield, especially in 1913-14, a droughty season as compared with 1912-13—a year of heavy rainfall. In support of the accuracy of these results, it will be noticed that if  $2\frac{1}{2}$  to 3 bags per acre is deducted from each of the 1913-14 returns, as being an increase due to the use of the fertiliser, the acre yields will agree very closely with those obtained without fertiliser in 1912-13. It is surprising to find the smallest yield of all being given by the two-furrow mouldboard plough, since as far as possible the mouldboard and the disc were both operated at a similar depth, namely, 6 to 7 inches. With native drivers, however, it is difficult to regulate this, and it is possible that the disc plough turned the land to a greater average depth than the mouldboard, since a mouldboard plough seldom works here to the best advantage in very dry soil. The most important lesson to be learned from this series of experiments is that deep ploughing gives an increased crop, especially in droughty seasons, but that for maize, where land can be ploughed with an ordinary plough from 7 to 8 inches in depth, or even more if possible, sub-soiling with a sub-soil plough is hardly profitable.

Over the remainder of the land, 30 acres in extent, ploughed with disc ploughs, and on which 150 lbs. per acre of Rhodesian Maize Fertiliser was broadcasted, thus coinciding in all respects with the 8 acres disc ploughed in the ploughing trials, the yield was  $8\frac{1}{2}$  bags per acre. This shews a small decrease over No. 1, though the decrease is within the limit of experimental error.

#### HICKORY KING (Eight Row).

(F)—A manurial experiment was arranged on an area of 50 acres; half manured with 100 lbs. per acre Rhodesian Maize Fertiliser, broadcasted, and half unmanured. This land is not a uniform soil throughout, while about one-fifth of each field was composed of new land not previously cropped. The 25 acres over which fertiliser was applied is composed of a chocolate soil merging into black, but the black is rather infertile, and contains patches where a yellow sub-soil comes to the surface. This yellow sub-soil is almost always a bad sign, as, where it occurs, the maize plants are invariably unhealthy,



and fail to carry large cobs. It was on this account, and with a view to levelling up the crop over the whole 50 acres, that the fertiliser was applied.

The unmanured land, mostly red soil merging into chocolate, gave a return of 207 bags, or approximately  $8\frac{1}{2}$  bags per acre, while the manured portion yielded 163 bags, or  $6\frac{1}{2}$  bags per acre. In this case the dressing of artificial fertiliser was not sufficiently heavy to make good the deficiencies of the soil.

#### SALISBURY WHITE MAIZE.

*Distance Planting Trials.*—These trials were carried out this season, and for the first time, on black land of poor fertility, and the results are not in agreement with those of previous years. The distance between the rows was varied, but not the espacement *between the plants*, namely, 15 inches. The returns were as follows:—

| Distance of planting.         | Yield per acre.      |
|-------------------------------|----------------------|
| 36 inches by 15 inches ... .. | $5\frac{3}{4}$ bags  |
| 42 inches by 15 inches ... .. | $8\frac{1}{2}$ bags  |
| 48 inches by 15 inches ... .. | $10\frac{1}{4}$ bags |
| 54 inches by 15 inches ... .. | $9\frac{1}{2}$ bags  |

During the past three years similar trials, carried out on red land, have consistently indicated that the smallest yields are obtained by close planting, and the heaviest by planting 42 inches by 15 inches. This is the standard, therefore, which has been adopted on the Government farms, and all other experimental sowings referred to in this article were so spaced. It would be unwise therefore to allow the above results to weigh too heavily in favour of ultra wide spacing.

Thin seeding is invariably recommended when farming under arid conditions, and it stands to reason that the fewer plants there are to the acre the more moisture will be available for each individual. Drought may, therefore, not improbably have been the reason of the wide spacing, this year, giving the heaviest crops.

More light will be thrown upon the subject by next season's trials, which will be duplicated on both red and black soils, but meanwhile  $3\frac{1}{2}$  feet between the rows may be accepted as an average standard.

## Eucalypts for the Farm.

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By J. J. BOOCOCK.

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On the majority of the farms which I have seen in Southern Rhodesia, although well supplied with indigenous species of trees, when long straight poles are required it is usually a difficult task to obtain them.

The *Brachystegia* (Msasa, Mfuta, Mnondo, etc.), which are the most common trees in the greater part of the country, have usually only a short bole, and this is often crooked, and most farmers will find it a profitable investment to lay down a small plantation of four or five acres of Eucalypts, or gums as they are generally called.

Many people imagine that there are only two species of gums—blue and red gums as they call them—whereas in reality there are about 200 species, varying in size from small shrubs to trees 300 feet in height.

The majority of gums grow very rapidly and have great absorptive powers of moisture. Consequently they should not be planted near springs or near the sources of streams.

In selecting a site for a plantation, the first thing to consider is the aspect, and this should if possible be a southerly, south-easterly or south-westerly one. Slopes facing the north are, as is well known, hot, and should be avoided. Low-lying places subject to severe frost must also be avoided. Having chosen a suitable site as regards aspect, the next step is to ascertain whether the soil is also suitable. A good forest soil should be neither too compact nor too loose in texture, and the deeper the soil the better. It is useless planting trees on shallow soil. Soils which are too stiff become water-logged and swampy in wet weather, and cake like cement in the dry season. Very few species of trees will grow satisfactorily in

such soils, although the Mopani seems to favour them. If the soil is too loose it will not retain moisture. The ideal soil is one that is porous, retentive of moisture and of great depth. Its chemical composition is of minor importance from a forestal point of view, although some species of trees are exacting and will not thrive if certain constituents are present in the soil or absent, as the case may be.

Being satisfied with the aspect and soil, the next thing to consider is the species. Roughly speaking, the soils in Southern Rhodesia can be divided into three classes, viz., the granite soils, which are of a sandy type, the red dioritic and schistose soils, and the black vleis soils. The latter are usually too stiff, and, apart from that, are required for the production of crops, and it is an axiom in forestry that land suitable for agricultural purposes should only in exceptional cases be set apart for the production of timber.

It must be borne in mind that tree planting in Rhodesia is only in its infancy, and the following lists, although serving as the best guide we have at present, may contain some species which will eventually turn out failures, for trees are not like field crops, whose success or otherwise can be ascertained in a single season. On the contrary, many trees will thrive for a few years, even in unsuitable localities, and it is only when they grow older and become more exacting that the real test takes place.

The following is a list of Eucalypts which so far have succeeded in dioritic and schistose soils:—*E. rostrata*, *E. citriodora*, *E. paniculata*, *E. botryoides*, *E. saligna*, *E. crebra*.

The following Eucalypts have so far succeeded on granite soils:—*E. rostrata*, *E. maculata* (tender to frost), *E. citriodora*, *E. paniculata*, *E. botryoides*, *E. saligna*, *E. corynocalyse*, *E. siberiana*.

Gum seed is sometimes sown *in situ*, but the usual method is to raise transplants in a nursery, which should be sheltered from the drying winds. The seed can be sown in beds prepared like tobacco beds, or in tins, etc. Personally, I prefer to use tins, as the whole tin can be removed into the shade when pricking out, but it is largely a matter of opinion as to which is the best method.





A good specimen of *Eucalyptus citriodora* growing in Public Gardens,  
Salisbury.





The soil should be worked into a fine tilth and the seed sown rather thickly, and then lightly covered with fine sand and well watered. Some people prefer not to cover the seed and get good results, but here again it is a matter of opinion. The tins or beds should then be shaded with grass, calico, etc., and when the seedlings shew up the shade gradually removed, and finally dispensed with altogether.

When the young trees possess two pairs of leaves they are large enough to be transplanted into tins. The best tins are half paraffin or petrol tins with holes punched in the bottom for drainage (a pick can be used for this purpose) and a tin will hold 30 trees.

Instead of using tins, the trees can be transplanted into beds like cabbages, but the best way in a country like this is to use tins.

Supposing that a farmer decides to lay down a small plantation, the best method to follow would be to tackle only a small portion each year, say an acre. Of course on farms where many boys are employed much larger areas can be planted, but it is sound policy to do a little and do it well.

Probably the best espacement for planting in the greater part of Southern Rhodesia is 6 feet by 6 feet apart. Where conditions are very favourable, as in parts of the Umtali district, 9 feet by 9 feet would not be too far apart.

At an espacement of 6 feet by 6 feet an acre will require approximately 1,210 trees, or allowing some extra ones for filling in blanks, which should be done the *same* season, it would be advisable to say 1,500 trees. This would require 50 half paraffin tins, and the same tins with care can be used for several years. Four ounces of seed would be sufficient to sow for this number of trees. Whether the young trees are pricked out into tins or beds, they must be shaded for a little time until they are well established; and they will also require watering, etc., until they are large enough to plant out. The best size for planting out is from 4 inches to 6 inches. Very large transplants of gums are not usually successful.

If possible, the planting out should be done on a rainy day; at any rate on a dull day. An ordinary garden trowel is



the best implement to use, and the plants should not be planted too deeply in the soil. A long piece of plain wire marked every six feet is the simplest thing to use to get the proper planting distance.

The ground which is to be planted should be broken up in the autumn, and the following spring harrowed and cross-ploughed. A second harrowing is usually necessary, but it is probably better to delay this until just before the trees are ready to plant out. With regard to the ploughing, the deeper this is done the better the result will be, and I am strongly of opinion that a mould board plough is the best to use when breaking up ground for trees.

It will probably be necessary to cultivate between the rows, but this depends upon the nature of the soil and indigenous vegetation. If the ground has been properly ploughed, etc., and all the indigenous vegetation killed, after cultivation may not be necessary. When the trees grow up and the branches meet they will themselves kill off any grass, etc., that may be growing among them.

All stock must be excluded from the planted area, and great care should be taken to exclude fires. Of course if there is no grass growing among the trees, there is not so much danger, although gum leaves are very inflammable, but it is better to keep a ploughed belt round the trees.

When the trees are large enough for poles they can be thinned out and the remainder left to grow into larger trees or cut clean and regenerated from coppice. Whatever method is adopted, the trees should be cut as near as possible to the ground, for if one is thinning out and does not require coppice from the felled trees, it is obvious waste to leave 12 inches or so of wood to be eaten by white ants; whilst when cutting clean and regenerating from coppice, apart from the waste, the shorter the stumps the better the coppice.

# Report on Certain Experiments

CARRIED OUT ON THE MATABELELAND EXPERIMENT FARM, LOCHARD, SEASON 1913-14.

By H. GODFREY MUNDY, F.L.S., Government Agriculturist and Botanist, and J. H. HAMPTON, Farm Manager.

The past season again proved most unfavourable to the experimental work carried out on the granite sand soils of the Longila Experiment Farm. The rainfall for the season from the 1st September, 1913, to the 30th June, 1914, amounted in all to 14.44 inches. Of this,  $8\frac{1}{4}$  inches fell between the 31st January and the 28th February, and only .33 inch from the latter date until the end of the season. Only the early maturing crops ripened to the best advantage, owing to the lack of rain during the later stages of growth, and all received a severe set back during the latter half of December and the whole of January, when only light misty showers fell, amounting to 1 inch between the 27th December and 30th January.

The fodder crops which have given the best returns have been Japanese Millet, German Millet, Teff Grass, Maize for silage, Velvet Beans and Napier's Fodder, whilst on the light sand of the ridges the yield of Buckwheat and Cow-peas has been encouraging. Napier's Fodder has again proved its great value for winter feeding, and Dhal gives promise of a very profitable crop.

JAPANESE MILLET (*Panicum crus-galli*).—Two acres of black vlel soil were sown to this crop. The ground was ploughed for the first time in March, 1913, cross-ploughed and disc and drag-harrowed before seeding. Seed was drilled at the rate of 20 lbs. per acre on the 27th December, no manure being applied. The germination was good, except in a few dry patches where the seed did not germinate until after the

February rains. Except around the borders of the plot where the soil was poor and the ground ploughed shallow, the growth was strong, and at no time did the crop shew signs of suffering from drought. By the end of February the greater part was in ear, and on the 27th March the first germination was ripe and cut for seed. At the same time the remainder which germinated in February was cut for hay. The yield of seed was 800 lbs. per acre, and of hay 2,500 lbs. per acre.

GERMAN MILLET (*Setaria italica*).—Four acres of black soil, which carried maize the previous season, and had before then been kaffir gardens, were sown to this crop. The ground was ploughed and drag-harrowed at the end of December. Seed was broadcasted at the rate of 15 lbs. per acre on 2nd January, and covered in with the Dunham roller. Only a very small proportion germinated until early in February. When the crop was established, however, the growth was rapid, and by the end of March three acres were cut for hay. The remainder was allowed to ripen, but, owing to uneven ripening and the depredation of small birds, the yield of seed—400 lbs. per acre—was only half of what it should have been. The three acres cut in March yielded two tons of cured hay of good quality.

TEFF GRASS (*Eragrostis abyssinica*).—Six acres of vlei soil were devoted to Teff Grass. Part of the plot carried rye and barley during the winter, and the remainder was new land ploughed, disc and drag-harrowed immediately before seeding. Seed was sown broadcast on the 6th January, at the rate of 8 lbs. per acre, and the land was then lightly rolled. The germination on the old land was good, but on the new land very patchy, and during the heavy rains of February part of the best soil was washed away. The crop, however, subsequently made good growth, and by the 28th March, the grass being then  $2\frac{1}{2}$  feet high, was cut for hay. The average yield of dry hay per acre was 1,850 lbs., but the weight from small patches on the richer soil would have been double this amount. One-and-three-quarter acres left to mature produced 800 lbs. of seed, equal to a yield of about 460 lbs. seed per acre.

The aftermath from the first cutting, after three weeks' growth, had attained a height of from 12 to 15 inches, and provided good pasturage for lambing ewes during the month of May.



As far as can be judged from the results of the past two seasons, these three summer forage crops—Japanese and German Millet and Teff Grass—can be relied upon to do well on the black soil found in the valleys of the granite areas, though on the light soil of the bults but poor yields of either hay or seed must be expected. Boer Manna, which resembles German Millet, will also do well on the same class of soil, but is several weeks slower to mature.

**SUMMER WHEATS.**—Comparative trials were carried out on light sandy soil with three varieties of Summer Wheat—Victoria ( $3\frac{1}{2}$  acres), Bishop (1 acre) and Yellow Cross (1 acre). The ground was ploughed and disc-harrowed for the first time during the winter of 1913, and again grubbed and drag-harrowed in December. Seed was drilled at the rate of 45 lbs. per acre on the 3rd January, and in the case of the Victoria and Bishop varieties, a light dressing of complete fertiliser was applied by means of the fertiliser attachment on the drill. Yellow Cross received no manure. Germination was good, but very little growth was made until the second week in February. The Yellow Cross proved much earlier than either of the others, coming into ear early in March, when the straw was 18 inches to 2 feet high. Harvested on the 23rd April, this variety gave a yield of 220 lbs. per acre. The other two varieties were a much thicker stand, and made stronger growth owing to the effects of the fertiliser, and with a reasonable amount of rain in March and April, would probably have given a fair crop. As it was, seed failed to form, and the crop was cut and converted into hay. It is evident that only a very light crop of wheat can be expected from the sand soil when unmanured, but in a normal year a fair crop of from 3 to 4 bags per acre should be reaped if a reasonable dressing of complete fertiliser has been applied. The fact that the Yellow Cross variety gave a return of 1 bag per acre, while the slower-maturing kinds failed entirely, demonstrates the importance of using early maturing crops in districts of scanty rainfall.

With a view to testing the moisture-retaining properties of the *high-lying sand soil*, a field of three acres was selected and treated in the following manner:—The ground was ploughed as deeply as possible during the latter part of the previous summer, and disc and drag-harrowed immediately

after ploughing. A dressing of eight tons of kraal manure per acre was applied during December, 1913, and afterwards the plot was again ploughed, sub-soiled and drag-harrowed.

Eight varieties of oats and wheat were tried, the seed being drilled at the rate of 60 lbs. per acre in the case of oats, and 45 lbs. per acre in the case of wheats. The following table shews the results obtained from the different varieties on this "dryland" plot:—

| Crop and acreage sown.                           | Date of sowing. | Subsequent cultivation.     | Rainfall during growing period. | Results.  |
|--|-----------------|-----------------------------|---------------------------------|---|
| Algerian Oats (1 acre)                           | 26/1/14         | Rolled once, harrowed twice | 8.58 ins.                       | Never came into ear, but provided good grazing for sheep during June.   |
| 60 Day Oats ( $\frac{1}{4}$ acre)                | 17/2/14         | Rolled once, harrowed once  | 1.66 ins.                       | A light crop of excellent oat hay was harvested on 5th June.  |
| Koffoid Wheat (3 rows)—a Utah dry-land variety   | 6/2/14          | Harrowed once               | 5.32 ins.                       | Two very late maturing varieties. Only reached a height of 6 to 8 ins., and then died off through lack of moisture.   |
| Gold Coin Wheat (2 rows)—a Utah dry-land variety | do.             | do.                         | do.                             |   |
| Nlargius Wheat ( $\frac{1}{2}$ acre)             | do.             | do.                         | do.                             | Fairly good stands were made of these four varieties, but very little grain, and that shrivelled, formed in the ears. All were cut for hay when no hope remained for a good return of seed. |
| Bishop Wheat ( $\frac{1}{2}$ acre)               | do.             | do.                         | do.                             |   |
| Du Toit Wheat ( $\frac{1}{4}$ acre)              | 17/2/14         | do.                         | 1.66 ins.                       |   |
| Le Roux Wheat ( $\frac{3}{4}$ acre)              | do.             | do.                         | do.                             |   |

The above results are what one would expect during a season like the past, when practically no rain fell in March and April. However, the fact that the 60 Day Oat gave a crop worth reaping shews the possibility of early-maturing cereals on sandy soil when sown late in summer, and it will be interesting to know how this same plot will crop during its second season.

**COWPEAS** (*Vigna catjang*).—Six varieties of Cowpeas were grown on new and unmanured sand land. The ground was first ploughed shallow in winter and again after the first rains of November, and afterwards disc and drag-harrowed. The varieties sown and acreages were as follows:—Natal Black,  $1\frac{1}{2}$  acres; New Era,  $1\frac{1}{2}$  acres; Iron,  $\frac{1}{2}$  acre; Black-eyed Susan,  $\frac{1}{2}$  acre; Whip-poor Will,  $\frac{1}{2}$  acre, and Unnamed,  $\frac{1}{2}$  acre. Seed was put in with a maize planter in rows  $2\frac{1}{2}$  feet apart and 1 foot apart in the rows on the 12th and 13th December. A good germination of all resulted, but the subsequent drought killed off many of the plants. The Natal Black and New Era, however, only suffered on the hard clayey soil of the ant-heaps, whereas the others suffered throughout the whole plots, and only half stands of each remained by the middle of January. Towards the end of January all except the Natal Black were attacked by an aphid, but the subsequent rains cleared away all signs of this, and growth after the heavy rains was rapid. The plots were twice cultivated with a horse-hoe between the rows.

The New Era (a bunch variety) matured earliest, ripening during the third week of March, and was harvested the first week of April. The other varieties ripened early in April, and all were harvested between the 15th and 22nd of the same month. The yields of seed per acre were as follows:—Natal Black, 480 lbs.; New Era, 300 lbs.; Whip-poor Will, 120 lbs.; Iron, 200 lbs.; Black-eyed Susan, 140 lbs.; and Unnamed, 120 lbs.

Owing to defective stands, the yields cannot be taken as a fair indication of what the last four varieties may do in a normal season. The Natal Black and New Era may, however, be considered successful. Apart from production of seed, the Natal Black, which is a semi-recumbent variety with abundance of leaf foliage, would prove well suited for grazing or for ploughing under as a green manure, whilst New Era, if sown thicker, would give a fine crop of hay.

Six rows of the Natal Black were cut for hay on the 20th March, and yielded at the rate of 1,100 lbs. baled hay per acre. A good second growth resulted from these six rows, and the plants at the end of May were still green, and would have afforded succulent pasturage for sheep.



**VELVET BEANS** (*Mucuna utilis*).—An acre of each class of soil (light sandy and black vle) was devoted to Velvet Beans, but the date of seeding (7th January) was rather late to allow of the crop reaching maturity before the frosts. A good stand was made in both plots, and the plants at no time suffered severely from drought. The growth in the black soil was good, the vines when fully grown covering the ground between the rows. A light crop of hay was reaped from the plot on the poorer soil, and the other plot, which was allowed to stand, was grazed down by the stock, when, owing to the advent of frosts, there remained no prospect of a return of seed.

A mixed crop of maize and velvet beans for silage has done well during the past two seasons. The velvet beans were first planted, in rows of 4 feet apart, and the maize 10 days later between the rows of beans.

**DHAL** (*Cajanus indicus*).—One-half acre of high-lying, poor, unmanured sand soil, which carried monkey-nuts the previous season, was sown to this crop. The ground was once ploughed and twice drag-harrowed, and the seed was sown on the 6th December in rows 2 feet 6 inches apart, and later on the plants were thinned out to stand 2 feet apart in the rows. Subsequent cultivations consisted of one hand-scuffling and two "grubbings" with horse-hoe. Although retarded in growth by the absence of rain in January, the plants made rapid progress after the February rains, and by the middle of March were standing 3 feet high. The crop came into flower the third week in April, when the plants were 4 feet to 5 feet high, and began to ripen seed early in July. This site was practically frost free, but another half-acre in low-lying ground was badly frosted towards the end of June, and only yielded a few pounds of sound seed. Harvested on the 21st August, the first half-acre plot yielded 165 lbs. of good seed, or at the rate of 330 lbs. per acre.

Although this yield is a light one, it must be considered good when it is remembered that less than half an inch of rain fell during the last six months of the growing period, and that the crop was grown on as poor a soil as any in Rhodesia. In harvesting, the plants were cut off 3 inches above the ground level, and new shoots quickly appeared on the old stems, so that there should be a better yield from the second year's growth.

BUCKWHEAT.—A comparative trial with two varieties of Buckwheat—Japanese ( $2\frac{1}{4}$  acres) and Silver Hulled ( $\frac{3}{4}$  acre)—was made on new and unmanured light sand. The seed was drilled on the 23rd December at the rate of 25 lbs. per acre Japanese and 33 lbs. Silver Hulled. The germination of both was good, but the want of subsequent rain prevented the crop from growing out, and the plants came into flower towards the end of Janaury, when only 9 inches to 1 foot high. The Japanese variety improved considerably with the February rains, and the plants reached a height of from 18 inches to 2 feet. The Silver Hulled, however, made no improvement, and was not considered worth reaping for seed. The former was harvested on the 31st March and threshed a fortnight later, giving a yield of 500 lbs. clean seed per acre. A considerable quantity of seed was wasted through shedding before or at time of reaping, and also through white ants attacking the “stooks” between the times of harvesting and threshing. In a normal year yields of from 600 to 700 lbs. per acre should be obtainable from this class of soil, and much more from the heavier vlei lands.

KAFFIR CORN.—Two varieties of Kaffir Corn—Common Red-seeded and White Sapling—were grown on poor, new and unmanured sandy soil. Each variety occupied one acre, and seed was drilled on 2nd December in rows  $2\frac{1}{2}$  feet apart at the rate of 6 lbs. of seed per acre. The plants when 6 inches high were thinned out to stand 12 inches apart in the rows. The germination of both was good, except on the ant-heaps, where the soil was hard and clayey, and where the light rains which fell previous to December failed to penetrate. The land was once cultivated with horse-hoe, and twice hand-hoed. During the last half of January the crop was at a standstill owing to lack of rain, but made rapid re-growth with the February rains. Although shewing less leaf growth, the plants of the red variety were higher and more robust, and ripened almost a month earlier than those of the White Sapling. The latter, however, suffered very little from pests, whereas with the red variety more than half the seed was taken by small birds. The Red-seeded variety was harvested on the 18th May and the Sapling on the 9th June, the acre yields being 250 lbs. and 470 lbs. respectively. White Sapling, though by no means “bird-proof,” is but little attacked when grown alongside the

more common varieties, and the best method of procuring a full yield from the former, when grown on an extensive scale, would appear to be by planting a few rows of the common variety here and there throughout the field. If this method is adopted, it is advisable to plant the decoy crop about 10 days to a fortnight later than the main crop, so that both varieties come into ear about the same time.

**NAPIER'S FODDER** (*Pennisetum purpureum*).—This perennial fodder crop has fully maintained the reputation it had already gained on the other Experiment Farms. From 50 rooted slips planted in the garden at the beginning of February, 1913, sufficient roots were obtained to plant out 2 acres at the beginning of the present season. Planted in rows 4 feet by 3 feet on the 3rd February, the crop was soon established and made rapid growth. Seven weeks after planting the grass was standing 3 feet high, and at the end of May, when the veld grass was parched, the crop was still green and standing 8 feet to 10 feet high in places. The plot was grazed down by stock during July and the early part of August, but after three weeks' rest a thick aftermath, 6 inches high, had sprung up again, and the whole stand remained verdantly green and grew rapidly throughout September and October, while the veld grass adjoining was still burnt up and dormant.

On granite farms, where dairying and stock-raising will be found more profitable than agriculture, no time should be lost in establishing large acreages of this fodder. A few slips planted one year means, with judicious treatment, a few acres the next, and with several well established and fenced paddocks of Napier's Fodder, permanent grazing throughout the entire year should be secured. For winter feed the crop must be planted in high-lying, frost-free situations.

Of the other crops tested, Field Radish and Sweet Potatoes on the light soil and Linseed and *Paspalum dilatatum* on the heavier soil of the vleis give good promise. The last mentioned has suffered severely from the effects of frost, but will no doubt recover with the advent of rains. Sunflower sown on land manured the previous season for mangels produced fairly good plants and heads, but the resulting seed, owing to drought, was shrivelled and of little value. Mangels



and pumpkins were again a failure on manured sand soil, and although shewing good promise in the early stages of growth, cabbage, rape and kohl-rabi died off through lack of moisture and the ravages of the green fly just when most needed. A light crop of early rye was reaped from new and unmanured sand soil, and it is possible that this cereal may do well if given a light dressing of artificial manure.

Hickory King Maize (8 row) on new and unmanured sand gave a yield of almost 5 bags per acre, while one acre of Salisbury White, manured with 150 lbs. Rhodesian Maize Fertiliser, gave  $3\frac{1}{2}$  bags per acre, and only 2 1-10th bags from the same area unmanured. In a year of average rainfall (20 to 25 inches) the heavy black soil of the vleis will produce much better yields than the above, but during the past two seasons only light crops of 3 to 4 bags per acre have resulted from this class of soil.

In common with the rest of Matabeleland, the Longila Experiment Farm, since its inception in January, 1912, has had to contend against most unfavourable seasons, the average rainfall for the three rainy seasons being about 13 inches. In consequence and owing to the natural hardness of the soil, great difficulty has been experienced in ploughing the land to a depth of more than 4 to 6 inches, and this fact, coupled with scanty rainfall, has naturally militated against heavy crops. Considerable progress can, however, be claimed to have been made, particularly in ascertaining the stock feeds most easily produced under light rainfall conditions in this part of Rhodesia. Without question the most important of these are cattle melons and silage as succulent feeds; millets, teff grass and maize or sorghum fodder for hay; and buckwheat, sunflower, maize and kaffir corn as grain crops. For feeding in the form of bean meal, cowpeas, velvet beans and dhal can be relied upon in normal seasons, while the latter is a safe standby in years of drought. Leguminous hay can be secured from ground nuts, velvet beans and cowpeas, and Napier's fodder or elephant grass holds pride of place for winter pasturage.

## Distomatosis or Liver Fluke, in Cattle and Sheep.

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By ROWLAND WILLIAMS, M.R.C.V.S.

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*Fasciola hepatica*, the common liver fluke, is a leaf-shaped parasite. It is slate-coloured, and has in this country a crinkled edge. It is about 1 inch in length and from  $\frac{1}{4}$  to  $\frac{1}{2}$  inch broad. The parasite is found in the liver of cattle and sheep, sometimes in such large numbers that it occludes the bile ducts and causes death to the host.

On *post-mortem* of an infected animal it depends to what extent the host is affected, and the length of time it has been affected, as to whether fat and good condition is present, or emaciation. Animals newly or only slightly affected seem to thrive well, and, on the contrary, animals affected for a long time or heavily infested with parasites are emaciated. The liver will be observed to be enlarged, also the gall bladder, and the bile ducts will stand out and be much whiter than normal. On section the bile ducts will be thick and fibrous.

The loss in this country last dry season was large enough to be important. Cattle affected last rainy season would probably not stand the drought like healthy cattle, and a large percentage have died of so-called poverty. On one ranch in Mashonaland the loss was very heavy; about 70 head of cattle died out of 1,000, and upon investigation the animals were found to be heavily infested with these parasites.

At present there is no known treatment for this disease. Many remedies have been tried without satisfactory results, and it will be understood how difficult it is to reach with a

drug a parasite so well protected by the thickened bile ducts in the liver.

To owners of farms free from this pest, a rough life history of this parasite will be helpful in taking preventive measures.

The adult hermaphrodite inhabits the bile ducts of cattle and sheep, and at certain periods, in accordance with the food the host consumes, lays eggs which pass out of the host with the fæces. Should these eggs be dropped on wet stagnant land, or on the edge of water holes, out of the egg is hatched a small swimming form of the fluke which finds for itself a host in a snail, in which it occupies part of the air chamber or lung; there another metamorphosis takes place, giving rise to still other forms of the parasite in large numbers. These forms break free from the now dead snail, attach themselves to blades of green grass, and there encyst and wait until some ox or sheep eats them, and so the cycle goes on.

I would suggest the draining of stagnant land as a means of prevention. The keeping of ducks and geese would, I think, help to keep down the snails. Salt is recognised as a good dressing for land affected with fluke.



## Statistics.

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By B. HASLEWOOD, F.S.S., Statistician.

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The general advantage to be gained from an organised system of statistical returns has been dealt with in the article that appeared in the last number of the *Journal*. It may not be out of place, however, to call attention to the special point that there will be in having some reliable and readily available estimate of the resources of this Territory in produce and live stock, at such a food crisis as there is every indication there will be next year.

The position in which by far the greater part of Europe will find itself, with only a very partial harvest reaped this autumn, and very little, if any, sowing possible in the coming spring, lends a peculiar emphasis to the desirability of countries more favourably situated in this respect, as is Rhodesia, doing all that is possible to increase their normal powers of production, and to put themselves in a position to be able, with confidence, to advertise their capabilities and resources to the world.

It is an accepted truism, to-day, that advertisement is the master-key to success in business. Its published statistics are, to a nation or community, what his season's catalogue is to a merchant.

With various kinds of bulbs already actually in use in Europe as substitute-ingredients for the making of bread, there can be no doubt there will be an increased demand for maize and maize-meal as a food for human beings, as well as for animals. Similarly, too, the enormous wastage that is going on there amongst cattle and sheep and live stock generally will have its after-effects in the shape of greatly enhanced prices, due to the increased demand required, not only to repair those ravages, but even to keep up with current needs.

The year 1914, which has seen the outbreak of "The Great War," will stand out for ever to the British Empire, and, very probably, to the whole civilised world, as a landmark in the reckoning of time; and it is certain that at least one universal standard for future comparison will be in regard to the conditions obtaining at or before the commencement of "The Great War," and afterwards. It may, perhaps, be regarded as singularly appropriate, therefore, that this year should also mark the initiation of Rhodesia's statistical record of her position and progress in regard to agriculture and stock.

In order that full advantage may be taken of these circumstances, it is obviously desirable to obtain such returns as will reflect the position as it actually is at the present juncture; and these returns, however simple and designedly limited in their scope, must at least be thoroughly trustworthy and, so far as they go, complete and truly representative of the whole farming community. Having in view the early attainment of this end, a special effort has been made to push forward the preliminary work, so as to get the forms out in time for returns to be made in regard to crops sown and reaped during the past season of 1913-14, and in regard to live stock for the year 1914.

In connection with this preliminary work, some considerable difficulty has been experienced in the matter of locating farms and their owners or occupiers; and this is due to the changes that have taken place, in the course of time, in regard to the personality of the owner or occupier, or both, as well as to the sub-divisions, amalgamations, and general re-distributions of the farm areas; while a further complication has been caused by the substitution, in many instances, of an entirely new name for the farm, in place of that under which it was registered when the title deeds were issued. But if, as well may be the case, there should be found to be errors and omissions in regard to the names and addresses of farmers, it is anticipated that all such difficulties will be overcome by the loyal and whole-hearted co-operation of the farming community, to whom the Administration looks with confidence for assistance, apart altogether from the compulsory powers conferred by the Agricultural Statistics Ordinance, which, together with the regulations framed thereunder, has been

duly promulgated, and is now in operation as a law of the land. It is hoped that if, for instance, forms should be sent to an owner who is not himself the occupier of that particular farm or farms, the recipient of the forms will be good enough to re-direct them at once to the proper person or persons; and the same applies in cases where the forms may not be correctly addressed to the owner or occupier of the farm or farms to which they are intended to apply.

It is the intention to send out the forms, on which the returns are to be made, during the early part of December, and it will be observed that very little is being asked for on this first occasion. The crops returns are confined to maize and tobacco, and it will, of course, be understood that it is the past season's working, *i.e.*, the 1913-14 season, that is referred to, all that is required being the number of acres under crop and the total yield in each case. As regards live stock, it has been necessary, in order to secure uniformity and avoid overlapping, to fix a date, *viz.*, the 27th of December, on which farmers and others are required to state the number of animals then actually on their farms; and these are grouped, in the simplest possible manner, under twelve distinct headings. Returns are also to be furnished of the quantity of butter, cream, milk, eggs, and wool sold during the preceding twelve months. Finally, the form is to be completed with the name, *i.e.*, the original and officially recognised name, of the farm to which it refers, together with the signature and full postal address of the farmer making the return, and is then to be sealed up and posted to reach the Department of Agriculture *not later than the 10th January, 1915.*





Killing day at the Bacon Factory, Salisbury.



## The Bacon Factory.

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The new Bacon Factory is now in working order, and the products, we are pleased to say, have met with a very good reception. Pigs have been forthcoming fairly freely, but the capacity of the Factory, which can deal with up to 300 pigs a month, has not yet been tested. The quality of the animals sent in has been very good, and so far only one beast has been condemned on account of disease.

The Factory is a very substantial building, and the outer walls are of such a thickness that the interior is always cool. The main building consists of sticking pen, pig sties, slaughter house, packing house, sausage room, bacon washing house, smoke room, and office. The pigs are received at the Factory siding and turned into an enclosed run. They are weighed straight off the truck and purchased by live weight. The pigs are afterwards turned into the sties, of which there are three, each capable of accommodating ten pigs. These sties are nicely completed with brick floors and are well-drained, thus ensuring the acme of cleanliness. It may be mentioned that the refuse from the sties and the runs will be conveyed to the adjacent lands, which are to be placed under irrigation with a view to breeding and feeding pigs on the premises. The pigs are kept in the sties for 24 hours and are then passed into the sticking pen. Thence the carcasses are conveyed by means of overhead tracking to the dumping table and the scalding tank. A clever arrangement lifts the carcase bodily from the tank on to the scraping table, where it is cleaned and disembowelled. From this point the pig is taken by means of the tracking to another weighing machine, where its dead weight is recorded. The backbone is afterwards taken out of the carcase and the two sides are placed in the chilling rooms.

The insulated chambers consist of the chilling rooms, air-lock, curing cellar and bacon store. These rooms are constructed in the most modern manner and are capable of holding the required temperature for several days. The temperature in the chilling room ranges between 30 and 35



degrees, and it has a capacity for dealing with 75 pigs a week. The sides of bacon are hung on iron bars, and the process of chilling takes two days to complete. Passing from this room, the sides enter the curing chamber, where they remain 14 days, subsequent to which they are smoked in the smoke room, and the bacon is ready for sale about 18 days after the pig has been killed. The air-lock referred to is a chamber between the chilling room and the curing chamber, and it is so arranged that when the main entrance door to the chambers is opened the hot air from without cannot penetrate into either the chilling or the curing rooms. This serves to maintain the temperatures in either room at a uniform degree. The walls of the chambers are insulated with charcoal.

What is required at the present time is more pigs. There is no doubt that in due course these will be forthcoming, and we feel sure that the breeding of pigs for the Factory will be found a very profitable undertaking. The attached circular, issued by the Acting Commercial Representative of the British South Africa Company, gives full particulars as to the conditions under which pigs are received at the Factory, and we would advise farmers to carefully study it. In regard to feeding and general attention, these important factors are dealt with in Departmental Bulletin No. 169, which can be obtained upon application to the Department of Agriculture.

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Bulawayo, 12th October, 1914.

### BACON FACTORY.

Dear Sir,

I have to inform you that the British South Africa Company's Bacon Factory at Salisbury is now completed, and the Company will be prepared to receive live pigs from Southern and Northern Rhodesia on and after the 15th instant, under the following conditions:—

Prices.—Pigs will be purchased at current market rates,  
viz. :

First Class Bacon Pigs 4½d. per lb. live weight.

Second Class Bacon Pigs 4d. per lb. live weight.

Delivered at the Factory, Salisbury.

The above prices apply only to prime, healthy, well fed, firm, killing pigs. A reduction will be made on all that are found after killing to be soft or otherwise of inferior quality, and such can only be purchased at their value to the Factory. These prices are quoted subject to amendment from time to time in accordance with market conditions.

Payment for pigs supplied will be made monthly.

*Veterinary Inspection.*—All carcasses will require to be passed as free from disease of any kind by a Government Veterinary Surgeon.

*Type of Pig Required.*—The average live weight should be from 150 lbs. to 200 lbs. Pigs exceeding 200 lbs. in weight are not required. The most readily saleable are those having a good even covering of flesh with a large proportion of lean meat, thick and firm in the belly parts. Very fat lardy pigs, especially those with an excess of fat on the back and on the inside of the belly, can only be used for second-class produce. Sows that have raised litters, old sows, boars, old castrated boars or “stags,” can only be expected to yield third-class or inferior produce. Prime bacon is produced from young sows or barrow pigs from 7 to 10 months old or thereabouts.

*Consignment of Pigs to the Factory.*—Pigs sent by rail must be consigned to the British South Africa Company's Bacon Factory, Salisbury, *Carriage Forward*. The railage will be deducted from the purchase price.

*Marking of Pigs.*—Before consignment all pigs must be carefully marked. Ear marking or clipping of the hair is recommended, as paint marks are sometimes unsatisfactory and liable to become obliterated in transit.

*Advice to Factory.*—The Manager of the Factory must be advised at least one post in advance of the number and full description of the animals to be despatched, how they are marked and whether packed in crates or loose. A specimen form of advice for this purpose can be supplied.

*Railway Rates.*—Attached hereto is a list of the Special Rates which have been granted by the Beira and Mashonaland and Rhodesia Railways for the conveyance of pigs to the Factory.

The forwarding of pigs in crates will, it is believed, be found more convenient to many farmers, as it will enable them to forward one or two by any train, and will ensure delivery of the animals in better condition. In such cases farmers and others are recommended to provide themselves with a suitable crate or crates, containing water-tight troughs, and plainly marked with the full address of the owner, to whom they will be returned free of charge.

In order to facilitate the delivery of pigs which are not packed in crates, and at the same time to obtain the benefit of the lowest rates, farmers are recommended to form themselves into groups, and to forward, as one consignment, lots of 20 or more animals.

Further information regarding trucks, train service, watering and other matters connected with the consignment of pigs, may be obtained from the Railway Company's official at all stations.

*Provision of Crates.*—Steps have been taken to obtain particulars of a suitable crate capable of holding one or two pigs, and which under normal conditions of handling would last for several years. The cost of such a crate is understood to be about £2, and the British South Africa Company is prepared to consider the question of supplying crates on easy terms of payment should there be a demand for them amongst farmers, whose views are invited.

*Pigs from Northern Rhodesia.*—Pigs from places in Northern Rhodesia will only be accepted for despatch to Salisbury on production of a Veterinary Certificate of Health in terms of Southern Rhodesia Government Notice No. 364 of 1914.

*General.*—Care should be taken that pigs intended for bacon purposes should not be bruised or knocked about, and when travelling to the station by wagon they should be protected from the sun and heat. Over-crowding or over-driving should be avoided. Pigs should not be fed heavily immediately before being loaded, but if they are to travel long distances, water and a slight feed should be arranged for at intervals.

I am, etc.,

W. OLIVE,

Acting Commercial Representative.



## PIGS CONSIGNED TO THE BACON FACTORY, SALISBURY.

The following rates (at owner's risk) will apply forthwith for a period of six months from 15th October to pigs consigned to the Bacon Factory, Salisbury:—

| From                          | To        | 1 pig in<br>crate. |    | 2 pigs in<br>crate. |    |
|-------------------------------|-----------|--------------------|----|---------------------|----|
|                               |           | s.                 | d. | s.                  | d. |
| All Stations                  | Salisbury | 10                 | 0  | 20                  | 0  |
| Broken Hill to                |           |                    |    |                     |    |
| Livingstone. (inclusive)      |           |                    |    |                     |    |
| All Stations                  | „         | 9                  | 0  | 18                  | 0  |
| Victoria Falls (inclusive) to |           |                    |    |                     |    |
| Malindi (inclusive)           |           |                    |    |                     |    |
| Gwaai                         | „         | 9                  | 0  | 17                  | 8  |
| Nyamandhlovu                  | „         | 8                  | 0  | 15                  | 0  |
| Bulawayo                      | „         | 7                  | 8  | 13                  | 6  |
| Heany Junction                | „         | 7                  | 4  | 12                  | 11 |
| Balla Balla                   | „         | 8                  | 0  | 14                  | 5  |
| Gwanda                        | „         | 8                  | 0  | 16                  | 0  |
| West Nicholson                | „         | 8                  | 0  | 16                  | 0  |
| Bembesi                       | „         | 7                  | 0  | 12                  | 4  |
| Insiza                        | „         | 6                  | 4  | 11                  | 1  |
| Shangani                      | „         | 6                  | 0  | 10                  | 6  |
| Gwelo                         | „         | 4                  | 9  | 8                   | 5  |
| Selukwe                       | „         | 5                  | 6  | 9                   | 7  |
| Umvuma                        | „         | 6                  | 4  | 11                  | 1  |
| Lalapanzi                     | „         | 5                  | 8  | 9                   | 11 |
| Victoria                      | „         | 8                  | 0  | 14                  | 1  |
| Globe and Phoenix             | „         | 3                  | 9  | 6                   | 7  |
| Battlefields                  | „         | 3                  | 1  | 5                   | 5  |
| Gatooma                       | „         | 2                  | 7  | 5                   | 0  |
| Hartley                       | „         | 2                  | 6  | 5                   | 0  |
| Gadzema                       | „         | 2                  | 6  | 5                   | 0  |
| Makwiro                       | „         | 2                  | 6  | 5                   | 0  |
| Mt. Hampden Junction          | „         | 2                  | 6  | 5                   | 0  |
| Banket Junction               | „         | 3                  | 5  | 6                   | 0  |
| Eldorado                      | „         | 3                  | 11 | 6                   | 11 |
| Sinoia                        | „         | 4                  | 1  | 7                   | 2  |
| Jumbo                         | „         | 2                  | 6  | 5                   | 0  |
| Bindura                       | „         | 3                  | 7  | 6                   | 4  |

| From        | To        | 1 pig in<br>crate. |    | 2 pigs in<br>crate. |    |
|-------------|-----------|--------------------|----|---------------------|----|
|             |           | s.                 | d. | s.                  | d. |
| Shamva      | Salisbury | 4                  | 3  | 7                   | 6  |
| Marandellas | „         | 2                  | 6  | 5                   | 0  |
| Macheke     | „         | 3                  | 5  | 6                   | 0  |
| Rusape      | „         | 5                  | 2  | 9                   | 0  |
| Odzi        | „         | 7                  | 0  | 12                  | 4  |
| Umtali      | „         | 7                  | 10 | 13                  | 10 |
| Plumtree    | „         | 8                  | 0  | 16                  | 0  |
| Matopos     | „         | 8                  | 0  | 16                  | 0  |

Pigs in crates consigned from sidings will be charged the rates applicable from the previous station, and senders of animals from sidings must load the crates on the trains.

Pigs in trucks (maximum load 35 pigs per short truck) will be charged the following rates:—

#### MILES (TRUCK RATES).

1 to 130. Ordinary rates, minimum charge, 30/- per short truck.

131 to 280. Flat rate of £4 per short truck.

281 and over. Half ordinary rates.

The cleansing fee of 1/- per short truck will be maintained.

Cartage charges at Salisbury, in the case of pigs in crates, will be added to the above rates, and may be taken as being 1/- per pig.

Empty crates will be returned free, at owner's risk, and consignors should have them addressed, "when empty, return to ———."

## Early Gluyas Wheat.

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Forty lbs. of Early Gluyas Wheat was sown by Messrs. C. & E. Konschel on their farm "Rustenburg," in the district of Salisbury, under the usual terms of co-operative experiments. The seed was sown in two lots of 20 lbs. each, as follows:—On 21st April, 1914, the first lot of seed was sown broadcast on unmanured but well fallowed land, without irrigation, and reaped on the 21st September last. The yield was 170 lbs. of clean seed. The second sowing took place on the 21st May, on the same class of soil, also without irrigation, and the crop was harvested on 20th October. Here the yield was 144 lbs. The wheat was sown as an experiment under dry-farming methods. The rainfall was very erratic—the last shower of any account fell at the end of February.

It was intended to try a small patch on old tobacco land (sandy soil), but owing to the shortage of rain it was decided that such an experiment under such adverse circumstances would prove futile, the soil at the period of sowing being almost too dry to expect germination.

The soil eventually chosen was a patch of naturally wet vlei, ploughed in March, which in parts was drying out rapidly. It was a blackish sandy loam.

The first patch (21st April) was harrowed in lightly with a medium weight tooth harrow, and was cultivated lightly with the same implement a month later. The second patch (21st May) was harrowed in with the harrow weighted down, and received no further cultivation.

Of the two plots, the first plot had the better appearance generally, and grew to a height of about 4 feet. The second plot stood more solidly, due no doubt to the seed being well harrowed in—the height was only about 30 inches. At the time of ripening of plot No. 1 there was very little moisture in the ground, in fact it was dry to about 6 inches below the surface.



Considering the unfavourable season, the crop, although the return appears small, is entirely satisfactory, the grain and ears being particularly well filled out.

It will be noticed that a much larger amount of seed was used per acre than is the usual practice. This was an oversight in sowing, but the error balanced up matters, as not all the wheat germinated. There were no insect or parasitic pests in the wheat, the only loss suffered being caused by the depredation of small buck. Rust was conspicuous by its absence.

Given a fair rainfall with a few sharp showers in April and May, there is every indication of wheat doing exceptionally well in vleis without irrigation, and tobacco lands (sandy) should produce quite a payable return without irrigation, provided the rainfall has been satisfactory during the season and the ground was ploughed somewhere about February and March and kept in good tilth. An experiment on tobacco land will be tried next season.

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## Good Preservative for Native Timber.

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I have found the following mixture particularly good for preserving native timber, which is so subject to the ravages of borers and white ants. It is useful for coating disselbooms in wagons and implements made from native timber, and which are often left exposed to all weathers on the farm:—  
**Mix well 1 gallon boiled linseed oil, 4 ounces arsenic. Apply two coats, the first coat to be allowed to harden for a week before applying the second one.**

THISTLE.

## Testing and Inoculation of Cattle in Great Britain prior to Export.

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Considerable interest is being manifested in the proposed facilities to be given under the direct auspices of the Imperial Government for the application of the tuberculin test and for the immunisation of cattle against redwater before exportation from the British Isles.

Hitherto the very necessary tuberculin test has been insisted upon in all oversea importations to Rhodesia, but difficulties have often attended the matter, and these the new arrangement should go far to overcome. The advisability of re-testing on arrival will remain, as it is occasionally found that animals after passing the test at Home develop tuberculosis and re-act on arrival. Inoculation against redwater will probably go far to render stock resistant to infection contracted after arrival, though whether completely so or not it is impossible to predict. Immunisation against gall-sickness is not yet proposed to be attempted, but the question is now under investigation by the Home authorities, in collaboration with South African experts, in the hope that such a process may be devised.

Rhodesian importers are advised to make necessary arrangements for the treatment of any stock they desire to submit to these processes, well in advance. Appended is a copy of a memorandum regarding the testing of cattle for tuberculosis and the immunisation of cattle against redwater issued by the Board of Agriculture and Fisheries:—

1. The Board have provided a testing station with accommodation for 100 head of cattle at Pirbright, Surrey, for the reception of cattle for the purpose of being tested for tuberculosis, or being immunised against redwater, prior to exportation abroad. The Board hope to provide further facilities as necessity arises, both as regards accommodation

and also the tests and immunisation to be carried out at the testing station.

2. A fee of £6 per head will be charged for the tuberculin test, a fee of £5 per head for immunisation against redwater, and a fee of £10 for the tuberculin test and immunisation combined. The fact that an animal has passed the tuberculin test or has been successfully immunised against redwater will be certified under the seal of the Board.

3. The fees include all charges for testing or immunisation, for food and attendance during 31 days, and for conveyance between the testing station and Brookwood Railway Station (L. & S. W. Rly.).

4. Payment of fees is to be made prior to the despatch of an animal to the testing station, by cheque, or by postal or money order, payable to the order of the Board of Agriculture and Fisheries and crossed Bank of England, and is to be forwarded to *The Secretary, Board of Agriculture and Fisheries, 4, Whitehall Place, London, S.W.* A form to accompany the remittance will be furnished by the Board, when notifying an owner that an animal can be received at the station. The Board do not undertake to accept delivery of an animal until the fee for it has been received.

5. Owners are responsible for the carriage of animals by rail to Brookwood Railway Station and thence after testing or immunisation to ports of embarkation.

6. Animals will be kept under observation at the testing station prior to the tuberculin test for 28 days, and the animal will be tested and available for removal after 31 days from the time of its arrival at the station, unless the test has to be postponed owing to some unforeseen circumstance. An animal received for immunisation only will, in the ordinary course, be available for removal after 28 days. Animals should not be sent to the station for longer periods prior to shipment than will suffice for their being tested or immunised, as the case may be.

7. If an animal is kept for a longer period than 31 days at the testing station to suit the convenience of an owner, an additional charge at the rate of 30s. per week will be payable



by the owner on demand by the Board, but if an animal is kept at the testing station for longer than 31 days owing to any unforeseen and unavoidable circumstances, this charge may be reduced by the Board.

8. Animals with respect to which certificates of immunisation have been issued are to be moved from Brookwood Station by rail, in sealed vans if required by the Board, direct to the port from which they are to be exported.

9. Applications for the testing or immunisation of cattle should be made at least a month before the date on which it is proposed to send the cattle to the cattle testing station. Forms of application can be obtained from *The Secretary, Board of Agriculture and Fisheries, 4, Whitehall Place, London, S.W.*

10. An undertaking is to be given that an animal which has been immunised will not be removed from the testing station except direct to the vessel on which it is to be exported.

11. The Board reserve power to refuse acceptance of an animal, or at any time to return to the owner an animal, if its retention in the testing station is, in the opinion of the Board, undesirable from any cause.

12. Every animal sent to the testing station must be provided with a strong head-stall or halter, and notification is to be given in respect of any animal that has at any time proved to be vicious or dangerous.

13. Where more than one animal is consigned to the testing station by an owner, each animal is to be marked for the purpose of identification by affixing an ear-tag or otherwise.

14. The animals, whilst under the charge of the Board, will be under the care and supervision of their Veterinary Officers, but the Board shall not be liable, nor shall compensation be paid, for any loss occasioned by the death, slaughter, injury, or illness of an animal, or by an accident to an animal, whilst under their charge or subsequently.

15. The Board reserve power, where they consider it to be necessary or desirable, to slaughter injured animals and

dispose of their carcasses. The proceeds will be paid to the owner.

16. Should an animal re-act to the tuberculin test, it will be disposed of in accordance with the directions (if any) given by the owner on the application form. If no such directions have been given, the animal will be consigned at owner's risk and cost to the premises from which it was sent to the testing station.

17. For the purpose of identification, every animal in respect of which a certificate is issued will be marked on the hoof or otherwise with a number by which the animal will be described on the certificate.

18. All communications should be addressed to *The Secretary, Board of Agriculture and Fisheries, 4, Whitehall Place, London, S.W.*, except notifications as to the time of arrival of animals. The latter should be sent direct to *The Inspector in charge, The Cattle Testing Station, Pirbright, Surrey.*

# Poultry Keeping for the Rhodesian Farmer.

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By FRANK SHEPPARD.

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On taking up the colony system of keeping poultry, it must not be thought that all our stock can be run on these lines. This method is the most satisfactory for the farmer as regards his laying hens, cockerels and growing chicks, but his breeding stock must be kept distinctly apart and mated up in separate pens.

At this time of year I do not advise putting chicks out into colony houses with free range until they are at least eight or ten weeks old, and heavy breeds, if they are feathering badly, later than that. They will probably stray some distance from their house, and are liable to be caught by the storms. The older chicks, after their first experience of rain, realise the danger and make for shelter as soon as the storm breaks, but the youngsters will huddle up under the nearest bush when the first drops fall, and remain there either till they are rescued or till they perish with cold. I have heard it said that it is a very difficult matter to rear chicks during our wet season; personally I have found it easier than during a hard winter in England. The chief reason for lack of success in rearing during the rains is, in most cases, unsuitable and often practically useless houses. As damp is one of the chief causes of disease, and is very much more harmful to youngsters than cold, it is necessary that their houses be perfectly dry, with a dry floor covered with chaff or litter.

The illustrations shew suitable types of movable colony houses and shelters for rearing our young stock during the wet season. No. 1 is open-fronted and is provided with a storm blind which was rolled up and not in use at the time the photo-



graph was taken. I consider a storm blind is essential with all our open-fronted houses during the wet season. Movable houses and brooders can always be turned with their back to the wind, but with a number in use, it is impossible to turn them all if the direction of the wind changes suddenly. I have found, when using open-fronted houses with storm blind facing north-west, there is no need to worry about the welfare of the youngsters when heavy rains and wind set in. The floor of the house should be two or three inches above the ground, and the front, including the door, should be covered with wire netting not larger than  $\frac{1}{2}$  inch mesh.

It is advisable to have some sort of shelter for the chicks, other than their sleeping quarters, in which they can be fed during the storms, and which can also serve as a scratching shed. They should never be fed inside their sleeping quarters, neither should their water be placed there. The ground in the shelter should be worked up and raised two or three inches above the outside surface and covered with chaff or litter. The hard food can be thrown amongst the litter if there happens to be heavy rain at the time when the birds are fed, but the soft food should be put in troughs. As their feeding should be regular and at definitely fixed times each day, the shelter will be found to be a great benefit, as there need be no waiting in till the rain ceases before feeding.

One of the most important points in rearing chickens is that they should receive their first feed of the day as soon as they wake. In some cases the preparation of their breakfast at such an early hour may inconvenience their attendant, but quite a small feed will satisfy their immediate wants till their proper breakfast can be prepared. Every advantage must be taken of the cool hour or two in the early morning when the chicks are able to range and take plenty of exercise to make up for the siesta which they will probably take during the heat of the day.

The second illustration shews a house similar to the previous one, but with the storm blind in use. The last illustration is of a semi-open-fronted house, suitable for chicks of, say, from six weeks to three months old. This type of house, which is made of galvanised iron with practically all the wood-work outside, may seem expensive, but a well made weather-

proof house free from draughts and which will last for many years, will be found far superior and cheaper in the long run than the type of house we usually see.

Early hatched pullets, which are now able to perch, should be moved into their permanent quarters before they come on to lay. The birds should not be moved more often than is necessary, as a frequent change of situation will retard their starting to lay. All moving should be done at night, when the birds are easily caught, and they should be placed on the perches in their new quarters. Their first feed the following morning should be placed as close to their house as possible, and also close to their drinking vessel, which should be at the side of the house, and sheltered from the sun.

I have heard of one instance of poultry kept on the colony system in Rhodesia where grass houses were used. I am not in favour of grass houses, especially when vermin are troublesome. A substantial movable open-fronted colony house can easily be made to hold thirty birds, which can be carried by natives when moved. Houses on wheels or runners and drawn by a horse when moved, as usually used in England and other countries, are not suitable for us, as, owing to the uneven nature of the ground, they are liable to be badly strained when moved unless they are made exceptionally strong. An open-fronted house is lighter in weight than the enclosed type principally used in colder climates, and it need not be made so large as to allow 10 cubic feet of air per bird as often advised, but there must be ample room on the perches to allow 8 inches to each bird. If the perches, which should be from  $1\frac{1}{2}$  to  $2\frac{1}{2}$  inches in diameter, are made of flat timber, the top corners should be rounded off. They should not be placed more than  $1\frac{1}{2}$  to 2 feet above the ground and must all be the same level. Although it saves room to fix the perches one above the other at an angle from the front to back of the house, it is not advisable, as the birds will crowd on to the highest ones, it being their nature to roost as far from danger as possible. Native timber makes excellent perches. Small irregularities and knots should be left on, and the perch should not be smoothed down, as if the birds are made to grip a smooth round surface while roosting it is liable to cause bumble-foot. The ends of the perches should not be fixtures and should be dressed now and then with paraffin. It is

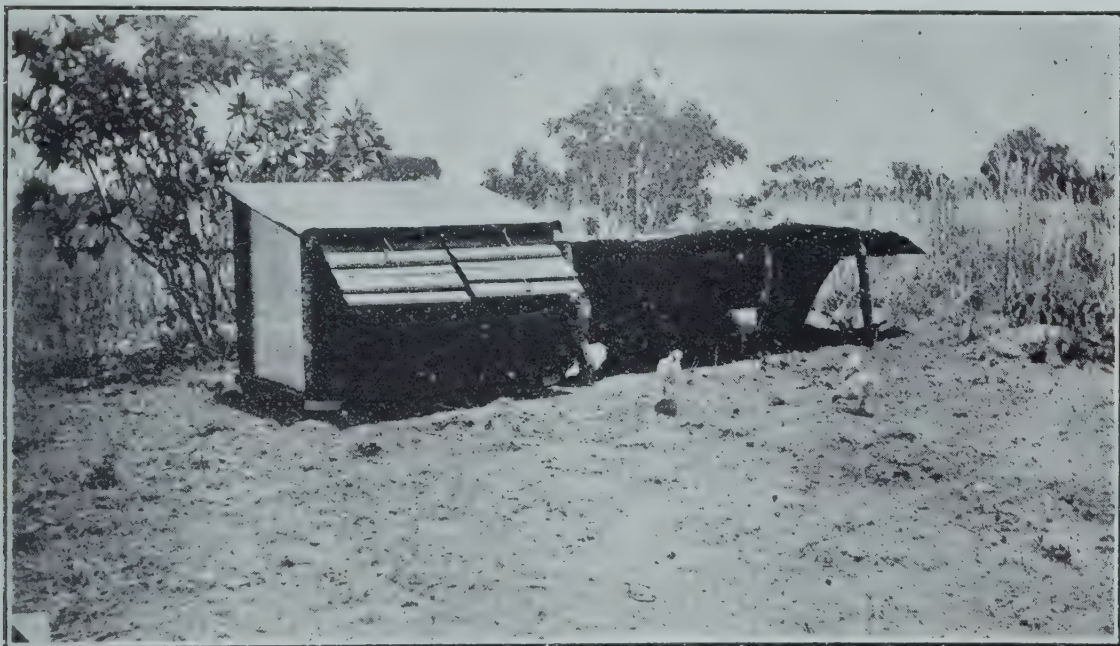
not necessary to have a floor. Sand-fleas will not trouble the birds as long as they roost on the perches. The nest boxes should, of course, have a bottom, and if possible should be raised a little, so that they are not in direct contact with the ground. A trench should be dug round this type of house to drain the surface water. The earth from the trench should be thrown inside the house to raise the bottom a few inches above the outside surface. The front should be of 1 inch wire netting, and provided with a door large enough for the attendant to enter, also a small one, which can easily be shut at nights, for the use of the birds. A storm blind of some sort should also be provided, as, although our old birds do not require the same care and protection from damp as our chicks, one must remember that a contented flock is a laying flock, and everything that is done for the care and welfare of the birds without coddling them will be repaid by the increase in the egg yield.

Although a movable colony house is usually the most suitable, there are cases when fixed houses will be found quite satisfactory. Taking into consideration the price of dressed timber and galvanised iron which will be required to make satisfactory movable houses, the large acreage of the farms and the inability to place the houses on the open cultivated land, we will find that a fixed house in many cases is quite as suitable as a movable one. When making poultry houses, some consideration should be taken of the size of the material on hand, in order to have as little waste as possible. A suitable open-fronted house can be made very cheaply from empty cement drums beaten flat and native timber, with a roofing felt or galvanised iron roof. The bottoms of the corner posts, after being treated with tar or some other weather resisting compound, should be sunk well into the ground, and if the sides are also sunk twelve inches or so and the ground inside raised a few inches, the house will be practically dry during the rains. A useful house of this type to hold 20 to 25 birds can readily be made from nine empty drums beaten out—four for the back, two for each end, the top one cut to allow for the slope of the roof, and one cut in half long ways, and the two halves sunk in the ground for the front. A wire netting front with a good strong door, and a roofing felt or galvanised iron roof, will complete a serviceable and practically vermin-proof





A movable colony house and shelter for rearing young chicks during the wet season. Storm blind rolled up.



Similar house to above with storm blind in use.



Semi open-fronted house, suitable for chicks of from six weeks to three months old.





house. The material with which houses are made will often depend upon what there is on hand at the time, but on the whole it is less trouble to make a good strong weather-proof house at the outset, than to have a faulty one which is draughty and leaking and requires continual attention.

The question as to the most suitable positions for colony houses will no doubt be a somewhat difficult one for the farmer who has had no previous experience in keeping poultry on these lines. As no two farms are similar, it is impossible to give any definite advice as to the most suitable positions for rearing chickens or establishing laying flocks; still, a few suggestions may be useful, on which the individual can base his plans. The arrangement of the whole of the poultry plant will be greatly influenced by the amount of personal attention the white members of the establishment are able to give to their birds.

The colonies of growing chickens should be as close to the homestead as is convenient, as, requiring more care and attention, time is not wasted in walking to and from their houses.

If it is impossible for the farmer who is single-handed to feed the chicks during the day, a trustworthy native can be left in charge, the food having been measured out beforehand, and definite instructions given as to what time they are to be fed and watered. I do not advocate the care of poultry on a farm being left to natives; in fact, with the exception of cleaning out the houses, there is very little work in connection with the birds that they can be trusted to carry out in a satisfactory manner. The feeding of the birds above all things should be carried out by a responsible person. In the case of the farmer who is single-handed, I should not advise him to attempt to rear poultry on a large scale. A small number of healthy, well-developed chicks will be less trouble than a large collection of diseased, backward birds, and will bring in more profit in the future. As all the houses must be shut at night to guard against vermin, and opened out in the morning, positions near to the homestead should be selected. If the farmer is only able to give a limited amount of personal attention to his birds, let one of the visits be paid first thing in the morning before sunrise, when the birds are let out, fed and watered. This should not be left to natives if possible, as it is the best time of the day for discovering any sick or ailing bird,



which will probably lag behind and not appear anxious for its food. The drinking water for fowls is quite as important as their feeding and housing, and a supply should be always before the birds in a clean vessel and shaded from the sun. If fowls are without water for any length of time and then drink to excess it is liable to bring on bowel trouble. Drinking warm water also has the same effect, especially amongst young chicks. Our old birds on a free range will be satisfied with quite a small feed in the morning, but their evening meal should be sufficient to enable them to go to roost with their crops reasonably full. A visit should be paid to the birds now and then after they have gone to rest, and by feeling the crops of one or two the attendant will know if they are receiving a proper ration.

In selecting the position of a house, whether for growing stock or laying birds, the first point to consider is shade for protection from sun, wind and hawks. This is absolutely necessary in Rhodesia, and it is impossible to have too much. In the early morning and evening our birds will range over the open ground and ploughed land, but during the many hours of sunshine they must have abundance of shade where they can roam at will. Energy and activity are two qualities we should look for amongst our birds; but these will not be found if they are obliged to spend most of the day under a small bush or on the shaded side of their house. The egg yield will be seriously affected, and probably liver disease will appear amongst the birds, if they are not continually on the move. The benefit of shade for poultry will be realised by my experience with two pens of White Leghorns of the same age and strain which were mated up in August last. No. 1 pen was practically all shade, whilst No. 2 pen, with the exception of one or two small bushes, had none. In that month No. 1 pen laid 63 eggs, No. 2 pen 59; in September, No. 1 pen 74 eggs, No. 2 pen 36; October, No. 1 pen 79 eggs and No. 2 pen 31. No liver disease appeared amongst No. 2 pen, but some of the birds were attacked by fleas through spending most of their time crouching under the small bushes. There is nothing to prove, of course, that lack of shade was the cause of the decrease in egg production of No. 2 pen, but I am confident that this was the reason, as since moving them into more suitable quarters their egg yield has greatly increased.

If there is no suitable land near to the homestead for establishing the flocks of laying birds, then I suggest that the houses be placed close to where the daily work of the farm is being carried on at the time; for instance, on the edge of the mealie lands during ploughing, provided, of course, there was ample shade near by. If the houses are placed so far from the homestead as to make it inconvenient for letting out the birds and feeding and watering before the sun rises, then I should suggest that a small strong wire run be attached to the house. This run can be closed at night, and the door into the house left open. The birds will then be able to leave their roosting house before it becomes too warm for either their comfort or health.

At farms where there is more than one white man, it will be much easier to rear and keep a large number of birds on open range, as the work and feeding can be divided, and they will receive more attention.

If it is found that on placing laying hens in colony houses many eggs are laid away, fix a small wire run round the house for a few days. The birds will then get used to laying in the nest boxes, and will be very little trouble when the run is removed.

Do not place the colonies of birds too close together, or the birds will probably all crowd into one or two of the houses. I have heard of houses when near to each other being painted different colours to enable the birds to distinguish their house by its colour, but I do not know whether this idea worked successfully.

All the early hatched cockerels should have already been separated from the pullets, and the best kept for stock birds next season. These can also be run in colony houses, but those that are intended for table birds should be penned up, as, although open range will make the birds hard and vigorous, it does not improve the quality of the flesh.

Great care must be taken if a forcing food is used for pullets coming on to lay, as it is liable to bring on apoplexy, especially in a warm climate. Do not on any account think of breeding from pullets yet. They should have been laying at least two months before being used as breeding birds. A good laying ration which is not forcing, and good housing, should



bring early hatched pullets on to lay now when eggs will soon be getting scarce.

A sharp look-out must be kept amongst the late hatched chicks for disease during the rains, and care taken that they are not hot and over-crowded during the warm nights. Over-crowding is liable to cause colds amongst the youngsters, and should at once be provided against. A piece of camphor in the drinking water will most probably effect a cure. If your chicks appear to have stopped growing, a change of ground will be found beneficial.

The one great drawback to keeping poultry on the colony system in Rhodesia is the liability to attack from hawks and other vermin. My own experience has taught me that birds are quite as likely to be lost when penned up near to the homestead as when running in the open bush. Even in districts where hawks are numerous, I feel sure the farmer will be well repaid by running his laying hens and older chicks where they can roam far and wide. Taking into consideration the great saving in the food bill, the small cost of wire netting, and last but not least, the health of the birds on free range, the loss of a few should not be regarded as sufficient to condemn the system.

In England, where the colony system is carried out successfully, the farmer's poultry is open to attack from foxes, rats, weasels, stoats and hedgehogs, and in some districts little owls do great damage amongst small chicks. On one farm where many hundreds of chicks are reared annually, nineteen foxes were trapped in two years, and on one occasion fifty-three pullets were killed in one morning by a stray dog: still, in spite of severe losses, the farmer assured me that his poultry were one of the most profitable branches of his farm. I remember one occasion when on opening a hot brooder in the early morning I found it empty. After giving information to the local police and casting suspicion on the whole village we found the thirty-eight lifeless bodies of our chicks from the brooder hidden by rats in an old disused pump near by. These instances will shew that in spite of severe losses now and then it is possible to make poultry keeping a profitable industry even where vermin are troublesome; but every precaution should be taken to guard against their attack.



## The Agricultural Outlook.

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The rains which fell during the early part of November improved the situation considerably, but at the time of writing unfortunately there has been nothing further. Reports go to shew that farmers in most districts are increasing their acreages, in order to meet the shortfall in food supplies that must occur in Europe, and it is to be hoped there will shortly be rain in sufficient quantity to enable them to plant.

Stock generally seem to be in surprisingly good condition for this time of the year, and disease is conspicuous by its absence. It is pleasing to note that in the Victoria district several good bulls of the Hereford, Shorthorn and Devon type have been introduced, and these in due course will no doubt leave their impress upon the stock of this fine cattle country.

In some parts of Matabeleland the scarcity of grazing and water is causing trouble, and in certain cases it has been found necessary to move stock to more favoured areas. Losses from poverty have so far been small, and this is due principally to farmers taking the precaution to lay by food supplies for the winter season. Grass fires have caused very considerable damage this year all over the country, and this has naturally added considerably to the difficulty of tiding over the long dry season.

Farmers who are growing oil-bearing crops will be pleased to know that the building of the Factory at Salisbury is proceeding apace, and it is expected to be ready in good time to deal with this season's crops.

From what can be gathered, the area placed under tobacco this season will be less than last year. This is only to be expected, in view of recent events, but we hope that before long a profitable market will be found for our surplus leaf and the industry progress in ratio to the potentialities of the country.

Citrus growing is assuming a prominent position in the agricultural practice of this country, and good progress is reported from various centres. A citrus expert has recently been attached to the Department of Agriculture, and his services can be obtained upon application as available.

## Veterinary Report.

September, 1914.

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### SALISBURY.

AFRICAN COAST FEVER.—No fresh outbreaks. Two animals were destroyed at the Epworth Mission and sixteen animals died at Bluff Hill.

MALLEIN TEST.—Ten horses tested and found free from the disease.

TUBERCULOSIS.—Two bulls tested and found free from the disease.

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### BULAWAYO.

AFRICAN COAST FEVER.—The last remaining centre was released from quarantine on 17th September, and Matabeleland has now been free from this disease for over eighteen months.

SCAB.—Two outbreaks reported in the Plumtree district are being dealt with.

MALLEIN TEST.—The following animals were tested with Mallein upon entering this Territory and were found free from glanders (Gwanda included):—Horses, 8; mules, 2; donkeys, 81.

IMPORTATIONS.—From England: 1 bull. From Union of South Africa: Horses, 18; mules, 2; donkeys, 81; heifers, 594; bulls, 19; sheep and goats, 3,446. From Northern Rhodesia: Oxen, 27.

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UMTALI.

AFRICAN COAST FEVER.—No cases of this disease occurred at the existing centres of N'Odzi, Mabonda or Penhalonga Valley.

*Nooitgedacht Farm, Melsetter.*—On arrival, the Government Veterinary Surgeon found the herd of cattle in which the outbreak occurred to consist of 100 head; of these, seven head have died or been destroyed.

On another portion of the farm is a herd of 30 animals belonging to a son of the owner of the farm; amongst these one animal was found to be suffering from the disease and was destroyed.

The two herds have now been brought together.

SCAB.—Seven outbreaks of this disease have been reported and are being dealt with.

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## GWELO.

No cases of contagious disease have been reported.

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## GENERAL.

Cases of Liver Fluke have been reported, and owners of moist vlel land should be careful and try to avoid introducing this disease into the property.

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October, 1914.

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## SALISBURY.

AFRICAN COAST FEVER.—An outbreak of this disease occurred on Tynwald Farm; one case only has so far occurred.

*Existing Outbreaks.*—Bluff Hill, two cases; Epworth Mission, three cases; M.T.C. Farm, no cases.



TUBERCULOSIS.—Two imported animals were tested with tuberculin, with no re-actions.

CONTAGIOUS ABORTION.—This disease was diagnosed in Southern Rhodesia for the first time. Two outbreaks occurred, one at Gatzi Farm, Marandellas. In this herd seven cows and heifers aborted. The other outbreak occurred amongst some cattle imported from Northern Rhodesia to the quarantine area at Sipolilo. In both instances the presence of the disease was corroborated by the application of the agglutination test applied by the Veterinary Bacteriologist.

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### BULAWAYO.

TUBERCULOSIS. — Thirty - nine half-bred heifers were tested, 7 of which re-acted and were destroyed, while 8 others shewed doubtful re-actions, and have been placed in quarantine pending a further test. At the same time 108 in-contact cattle were also tested, but with negative results.

SCAB.—A further outbreak in Plumtree district. The animals have been placed in quarantine and dipping carried out.

MALLEIN TEST.—The following animals were tested for glanders upon importation, with no re-actions:—Horses, 14; donkeys, 20.

IMPORTATIONS.—From England: 4 bulls and 7 heifers. From the South: Horses, 14; donkeys, 20; heifers, 101; bulls, 7; sheep and goats, 3,919. From Northern Rhodesia: 146 slaughter cattle.

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### UMTALI.

AFRICAN COAST FEVER.—No cases at N'Odzi, Mabondæ or Penhalonga.

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### GWELO.

SCAB.—Three cases discovered, and being dealt with.

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MELSETTER.

AFRICAN COAST FEVER.—Six cases occurred at Nooitgedacht during the month.

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## MAKONI.

SCAB.—One native flock found to be infected.

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## GENERAL.

Many cases of three-day sickness have occurred in the Victoria district. A few cases have occurred also in the Salisbury and Gwelo districts. As has been found in previous outbreaks, nearly all animals if left alone recover, but the administration of medicine is often attended with fatal results.

Deaths of cattle from poverty have been reported from several places in the Salisbury neighbourhood.

C. R. EDMONDS,

Acting Chief Veterinary Surgeon.

## Garden Calendar.

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By N. L. KAYE-EDDIE.

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### THE FLOWER GARDEN.

*December.*—This month is generally showery, and constant stirring of the soil is, therefore, necessary to keep it loose. Seeds of perennials and annuals for February blooms may be sown. Transplanting should be done in the evening on a cloudy day. Carnations should be kept free from dead wood, and climbers attended to.

*January.*—This month requires all one's energy in the flower garden. Annuals may still be sown for late flowering before the season is over. Planting out should be done as early as the weather permits, and advantage taken of a dull day after a shower for this work. If care be exercised much smaller plants may be put out than would at first be thought advisable, as with attention these will make stronger plants than larger ones, which are more likely to receive a check. The soil requires constant stirring, owing to the packing caused by the rains and for the eradication of weeds, which are now very troublesome. All plants should be kept free of dead and decaying matter.

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### THE VEGETABLE GARDEN.

*December.*—All vegetable seeds may be planted. All advanced plants should be constantly cultivated. Potatoes should be ridged, and peas, beans and tomatoes staked. This is a good month for planting the main crop of potatoes.

*January.*—Turnips, carrots, cabbage, lettuce, etc., may be sown for carrying on during the winter months. Potatoes may be planted this month for keeping through the winter. Weeding and cultivating between the rows should be continually carried on.



## Wool and Skins Market.

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The Union Produce Mart, Ltd., Port Elizabeth, report as follows on the 13th November:—

**WOOL.**—We regret to say that the steadiness in the market of last week has disappeared, and the market at the present moment is what we consider weak. This refers more especially to the heavier descriptions, and also the ordinary parcels. In super wools on the other hand there is very little change, but one can reckon on the two previous descriptions being fully  $\frac{1}{4}$ d. to  $\frac{1}{2}$ d. lower. As a matter of fact for very heavy wools there are no buyers, and we strongly recommend you to leave such wools severely alone. This weakness in the market has been brought about through the weakness in the Australian market. This has also affected the English and American markets. We would advise you to continue operating freely, but to be very careful and keep to the best descriptions of wool, and to leave the heavier wools alone for the time being until a demand crops up for same.

**MOHAIR.**—Mixed hair is selling rather well at from  $6\frac{3}{4}$ d. to  $7\frac{1}{4}$ d. As a matter of fact good mixed blue hair is worth even more. We have sold a fair quantity of winter hair at  $7\frac{1}{2}$ d., but kids, which started at 11d., and advanced to 1s., are now back to 11d. This is for good ordinary parcels. For anything super, that is long silky kids, 1s. might be obtainable, but only in very isolated cases. We think mohair will remain unchanged, and would advise buying to sell at our quotations.

**OSTRICH FEATHERS.**—A sale will take place on Monday, 16th, and we will then be able to advise you more or less what to do. At the moment the only transactions taking place are out of hand, and this is more or less limited.

**SKINS.**—The market remains firm, but we fear that sheep skins and hides have a downward tendency. Sound sheep skins are quoted at  $5\frac{1}{2}$ d. per lb. and damaged at  $4\frac{1}{2}$ d. per lb. Sun-dried hides are quoted at  $11\frac{1}{2}$ d. per lb. and dry salted at  $10\frac{1}{2}$ d. per lb. less 1d. per lb. for damages.

## Market Reports.

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The produce market at Salisbury is well supplied with all lines. At Bulawayo prices are firm. Potatoes are still scarce, but supplies of new potatoes from the Colony are now arriving. The Johannesburg market is well supplied in most lines, but there is an unsatisfied demand for oats, grass, hay, bedding, kaffir corn, crushed mealies, peas, sunflower seed, buckwheat and tobacco. Local butter is scarce at Salisbury.

There is a demand for slaughter stock at Salisbury, but otherwise the stock market is flat. At Bulawayo the supply of slaughter cattle and sheep is very limited. There is practically no demand for mules or donkeys at either Salisbury or Bulawayo.

There have been few stock sales since our last issue. At Messrs. Boggie & Co.'s last quarterly sale, held in conjunction with Mr. A. E. White, at Gwelo, about 800 head entered the sale yards, and notwithstanding the war and the shortage of money, there was a large attendance of buyers from all parts of the country. The principal demand was for slaughter stock, some heavy animals coming under the hammer. The highest price realised was £13 10s., and in some cases the price paid worked out at 50s. per 100 lbs. Trek oxen, of which there was a large number, fetched a fair price, the average for colonial oxen being about £8. Breeding stock was not in demand, but most of those on offer were in poor condition, and buyers, probably on account of the wretched condition of the veld, were not keen on purchasing. Some promising heifers were sold for as low a figure as £5 10s., while the average price was probably not more than £7.

There was no demand for horses, mules, or donkeys, while Cape carts and other vehicles were a drug on the market.

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A large cattle sale was conducted by Mr. A. G. Hay at West Nicholson on Saturday, the 24th October. Buyers were present from Gatooma, Que Que, Salisbury, Gwelo, Bulawayo and district, and the sale was a great success. Up to the time of adjournment for lunch, 12.45, some 730 head of cattle had been disposed of. Bidding was very spirited the whole morning, and the prices realised were: Slaughter oxen, £6 10s. to £9 5s.; cows, £3 7s. 6d. to £6 17s. 6d.; Tuli cows, £6 10s. to £7 7s. 6d.; three-quarter-bred Shorthorn bulls, 1 to 3 years, £9 to £11 10s.; native cows, £5 12s. 6d.; young oxen, £3 17s. 6d.; horses, £14; mules, £8; goats, 7s. to 14s.; tollies, £2 10s. The number of cattle sold and the total realised of the whole sale, which was continued for a short while on the next morning, undoubtedly constituted a record for the district.



| Article.                         | Johannesburg.            | Kimberley. | Bulawayo.                 | Salisbury. |
|----------------------------------|--------------------------|------------|---------------------------|------------|
| Barley, 150 lbs.                 | 8/0 9/0                  | —          | —                         | 25/0       |
| Beans, 203 lbs.                  | 16/0 23/6                | —          | —                         | 15/0 35/0  |
| Boer Meal, unsifted,<br>200 lbs. | —                        | —          | 45/6 46/6                 | 45/0       |
| Bran, wheaten, 100 lbs.          | 6/10 7/0                 | —          | 13/0 14/0                 | 14/0       |
| Flour, 100 lbs.                  | —                        | —          | —                         | 20/0 25/0  |
| „ Colonial, 100 lbs.             | —                        | —          | 25/0 27/6                 | —          |
| Forage, 100 lbs.                 | —                        | 5/6        | 10/0 11/0                 | 7/0        |
| „ Colonial Oat                   | 8/3 8/6                  | —          | —                         | —          |
| Hay                              | <sup>Bale.</sup> 1/3 1/6 | —          | <sup>Ton.</sup> 65/0 70/0 | None.      |
| Kaffir Corn, 200 lbs.            | 9/0 9/10                 | 10/6 11/0  | 16/6 17/6                 | 13/6       |
| Manna, 100 lbs., Seed            | —                        | —          | —                         | 25/0       |
| Mealies, S.A. White,<br>203 lbs. | 9/3 9/6                  | 10/6       | 12/6 13/6                 | 9/0 9/6    |
| Mealies, Yellow, 203 lbs.        | 10/0 10/4                | 10/9       | 12/6 13/6                 | None.      |
| Mealie Meal, White,<br>183 lbs.  | —                        | —          | —                         | 9/0 9/6    |
| Munga, 200 lbs.                  | —                        | —          | —                         | 10/0       |
| Monkey Nuts, bag, 83 lbs.        | —                        | —          | 10/0 11/0                 | 6/0        |
| Oats, 150 lbs.                   | —                        | —          | —                         | 23/6 25/0  |
| Onions, 120 lbs.                 | 10/0 12/6                | 7/6 12/6   | —                         | 17/6       |
| Peas, 200 lbs.                   | —                        | —          | —                         | 45/0       |
| Potatoes, new, 150 lbs.          | 20/0 23/6                | 12/6 25/6  | 33/0 35/0                 | 20/0       |
| „ old, 150 lbs.                  | 8/0 14/0                 | —          | —                         | None.      |
| Rapoko                           | —                        | —          | —                         | 6/6 7/0    |
| Rye, 200 lbs.                    | 19/0 19/9                | —          | —                         | 25/0       |
| Salt, 200 lbs.                   | —                        | —          | 10/0 11/0                 | 11/0       |
| Wheat, 203 lbs.                  | 49/0 52/0                | —          | —                         | 35/0       |
| Butter, local, per lb.           | 1/3 1/4                  | 1/5 1/7    | 1/6 2/0                   | 2/6 3/0    |
| Eggs, local, per dozen           | 1/3 1/6                  | 10d. 1/1   | 1/6 1/9                   | 2/6        |
| Ducks, each                      | —                        | 3/0 3/4    | —                         | 3/6 5/0    |
| Fowls, each                      | —                        | 1/6 2/3    | 1/3 1/9                   | 2/0 3/6    |
| Geese, each                      | 3/0 4/0                  | —          | —                         | 7/0 9/0    |
| Turkeys, cocks, each             | 6/0 14/0                 | 5/3 9/6    | —                         | 15/0 17/0  |

## LIVE STOCK.

|                            |               |   |            |           |
|----------------------------|---------------|---|------------|-----------|
| Slaughter Cattle, 100 lbs. | 35/0 36/6     | — | 30/0 40/0  | 40/0      |
| Trek Oxen, trained         | £7/10 £8/10   | — | £6 £9      | £9 £11    |
| Local Cows, milk           | —             | — | £17/10 £30 | —         |
| Dairy Cows                 | —             | — | £20 £35    | £25 £30   |
| Native Cows                | —             | — | —          | £7/10     |
| Heifers, Colonial          | £3/10 £4      | — | £7/10 £10  | £7 £8     |
| „ Native                   | —             | — | —          | £4/10 £6  |
| Pigs, live weight          | 4½d. 5½d.     | — | 4d. 5d.    | 4d.       |
| Horses, riding, salted     | —             | — | —          | £30 £40   |
| „ „ unsalted               | £22/10 £27/10 | — | £15 £35    | £22/10    |
| Mules, inoculated          | £25 £30       | — | £30 £40    | £20 £25   |
| Donkeys, geldings          | £2/10 £3/10   | — | £3/10 £5   | £4 £6     |
| „ mares                    | £2/10 £3/10   | — | £5 £6      | £5 £6/10  |
| Goats                      | 12/6 13/6     | — | 10/0 17/6  | 12/6 15/0 |
| Persian Ewes               | —             | — | 20/0 21/0  | 17/6 25/0 |
| Cross-bred Ewes            | —             | — | —          | —         |
| Sheep, slaughter           | 16/0 18/6     | — | 15/0 18/6  | 20/0 25/0 |

# Weather Bureau.

## TEMPERATURES.

| STATION                         | SEPTEMBER    |              | OCTOBER      |              |
|---------------------------------|--------------|--------------|--------------|--------------|
|                                 | Mean<br>Max. | Mean<br>Min. | Mean<br>Max. | Mean<br>Min. |
| <b>MASHONALAND—</b>             |              |              |              |              |
| Hartley, Gatooma ...            | 90·8         | 51·5         | 94·2         | 60·1         |
| „ Giant Mine ...                | 88·9         | 50·9         | 92·5         | 64·4         |
| „ Hallingbury Farm ...          | 89·0         | 50·5         | —            | —            |
| Lomagundi, Eldorado Mine ...    | 89·8         | 55·2         | 93·9         | 61·5         |
| „ Kanyemba ...                  | 96·2         | 69·9         | 100·5        | 74·6         |
| „ Sinoia ...                    | 89·0         | 52·0         | 96·9         | 57·2         |
| „ Sipolilo ...                  | 86·9         | 56·7         | —            | —            |
| Makoni, River Junction ...      | —            | —            | —            | —            |
| Mazoe, Shamva Mine ...          | 86·3         | 57·2         | 90·7         | 63·4         |
| Melsetter ...                   | 75·5         | —            | 78·8         | —            |
| „ Mount Selinda ...             | 77·2         | 54·2         | —            | —            |
| „ Vermont ...                   | —            | —            | —            | —            |
| Salisbury, Chishawasha ...      | 80·6         | 48·7         | 84·9         | 54·5         |
| „ The Gaol... ...               | 86·2         | 51·7         | 90·8         | 55·6         |
| Umtali, Chiconga's Location ... | 83·8         | 55·3         | 87·7         | 59·9         |
| „ Summerfield ...               | 71·4         | 57·6         | 73·7         | 60·0         |
| Victoria ...                    | 83·8         | 53·3         | —            | —            |
| „ Eythorne ...                  | 86·7         | 50·1         | 91·6         | 57·0         |
| <b>MATABELELAND—</b>            |              |              |              |              |
| Bulawayo, Essexvale ...         | 87·9         | 54·9         | 89·1         | 60·6         |
| „ Observatory ...               | 84·2         | 56·8         | 86·4         | 62·1         |
| „ Rhodes Matopo Park... ..      | 91·4         | 52·9         | 94·1         | 60·8         |
| Gwelo, The Gaol ...             | 85·7         | —            | 88·0         | —            |
| Mangwe, Empandeni ...           | 90·8         | —            | 93·8         | —            |
| Tuli ...                        | 88·1         | 59·8         | 94·0         | 66·0         |
| Wankie, The Hospital ...        | 95·7         | 67·3         | 101·3        | 74·1         |
| Victoria Falls ...              | 93·5         | 46·4         | 99·1         | 55·2         |

## RAINFALL.

| STATION              | September | October |
|----------------------|-----------|---------|
| <b>MASHONALAND :</b> |           |         |
| Charter—             |           |         |
| Buhera ...           | Nil       | 0·07    |
| Driefontein ...      | Nil       | Nil     |
| Enkeldoorn ...       | Nil       | Nil     |
| Grootfontein ...     | Nil       | Nil     |
| Marshbrook ...       | Nil       | Nil     |
| The Range ...        | Nil       | 0·08    |
| Riversdale ...       | Nil       | Nil     |
| Umvuma (Railway) ... | Nil       | Nil     |

## RAINFALL—(Continued).

| STATION                        |     |     |     | September | October |
|--------------------------------|-----|-----|-----|-----------|---------|
| <b>MASHONALAND—(Continued)</b> |     |     |     |           |         |
| Hartley—                       |     |     |     |           |         |
| Ardgowan                       | ... | ... | ... | Nil       | Nil     |
| Auchter Leny                   | ... | ... | ... | 0·14      | Nil     |
| Battlefields (Railway)         | ... | ... | ... | Nil       | Nil     |
| Beatrice Mine                  | ... | ... | ... | Nil       | Nil     |
| Carnock Farm                   | ... | ... | ... | Nil       | Nil     |
| Norton Siding                  | ... | ... | ... | Nil       | Nil     |
| Elvington                      | ... | ... | ... | Nil       | Nil     |
| Franceys                       | ... | ... | ... | Nil       | Nil     |
| Gatooma                        | ... | ... | ... | Nil       | Nil     |
| Gatooma (Railway)              | ... | ... | ... | Nil       | Nil     |
| Giant Mine                     | ... | ... | ... | Nil       | Nil     |
| Gowerlands                     | ... | ... | ... | Nil       | Nil     |
| Hallingbury                    | ... | ... | ... | Nil       | Nil     |
| Hartley (Railway)              | ... | ... | ... | Nil       | Nil     |
| M'pofha                        | ... | ... | ... | Nil       | Nil     |
| "Jenkinstown"                  | ... | ... | ... | Nil       | Nil     |
| Makwiro                        | ... | ... | ... | Nil       | Nil     |
| Shagari                        | ... | ... | ... | Nil       | Nil     |
| "Stoneygate"                   | ... | ... | ... | Nil       | Nil     |
| Lomagundi—                     |     |     |     |           |         |
| Banket Junction (Railway)      | ... | ... | ... | Nil       | Nil     |
| Darwendale                     | ... | ... | ... | 0·05      | Nil     |
| Duxbury Farm                   | ... | ... | ... | 0·08      | 0·07    |
| Eldorado Mine                  | ... | ... | ... | Nil       | Nil     |
| " (Railway)                    | ... | ... | ... | Nil       | Nil     |
| Golden Kopje Mine              | ... | ... | ... | Nil       | Nil     |
| Kanyemba                       | ... | ... | ... | Nil       | Nil     |
| Longmead                       | ... | ... | ... | Nil       | 0·01    |
| Palm Tree Farm                 | ... | ... | ... | Nil       | Nil     |
| Sinoia                         | ... | ... | ... | Nil       | Nil     |
| Sipolilo                       | ... | ... | ... | Nil       | Nil     |
| Umvukwe Ranche                 | ... | ... | ... | Nil       | Nil     |
| Makoni—                        |     |     |     |           |         |
| Chimbi Source                  | ... | ... | ... | Nil       | 0·15    |
| Eagle's Nest                   | ... | ... | ... | Nil       | Nil     |
| Ellavale                       | ... | ... | ... | Nil       | 0·05    |
| Inyanga                        | ... | ... | ... | Nil       | Nil     |
| Mona                           | ... | ... | ... | Nil       | Nil     |
| Monte Cassino Mission          | ... | ... | ... | Nil       | Nil     |
| Odzi (Railway)                 | ... | ... | ... | Nil       | Nil     |
| River Junction                 | ... | ... | ... | Nil       | Nil     |
| Rusape (Railway)               | ... | ... | ... | Nil       | Nil     |
| Springs                        | ... | ... | ... | Nil       | Nil     |
| St. Trias' Hill                | ... | ... | ... | 0·03      | Nil     |
| York Farm                      | ... | ... | ... | Nil       | Nil     |
| Mangwendi—                     |     |     |     |           |         |
| Bonongwe                       | ... | ... | ... | Nil       | Nil     |
| Glen Somerset                  | ... | ... | ... | 0·32      | Nil     |
| Land Settlement Farm           | ... | ... | ... | Nil       | Nil     |
| Macheke (Railway)              | ... | ... | ... | Nil       | Nil     |



## RAINFALL—(Continued).

| STATION                           |     |     |     | September | October |
|-----------------------------------|-----|-----|-----|-----------|---------|
| MASHONALAND—(Continued)           |     |     |     |           |         |
| Mangwendi (Continued)             |     |     |     |           |         |
| Marandellas                       | ... | ... | ..  | Nil       | Nil     |
| Marandellas (Railway)             | ... | ... | ... | "         | "       |
| Mrewa                             | ... | ... | ... | 0·02      | "       |
| Mungo                             | ... | ... | ... | Nil       | "       |
| Rusawi Outspan                    | ... | ... | ... | "         | "       |
| Selous Nek                        | ... | ... | ... | 0·10      | "       |
| Tweedjan                          | ... | ... | ... | Nil       | "       |
| Mazoe—                            |     |     |     |           |         |
| Avonduur                          | ... | ..  | ... | Nil       | Nil     |
| Bindura                           | ... | ... | ... | "         | "       |
| Bindura (Railway)                 | ... | ... | ... | "         | "       |
| Ceres                             | ... | ... | ... | "         | "       |
| Chipoli                           | ... | ... | ... | "         | "       |
| Claverhill                        | ... | ... | ... | "         | "       |
| Darwin                            | ... | ... | ... | "         | "       |
| Dunmaglas                         | ... | ... | ... | "         | "       |
| Laguaha                           | ... | ... | ... | "         | "       |
| Lowdale                           | ... | ... | ... | "         | "       |
| Mazoe                             | ... | ... | ... | "         | "       |
| Mguta Valley                      | ... | ... | ... | "         | "       |
| Omeath                            | ... | ... | ... | "         | "       |
| Ruia                              | ... | ... | ... | "         | "       |
| Shamva                            | ... | ... | ... | "         | "       |
| „ Mine                            | ... | ... | ... | "         | "       |
| Sunnyside                         | ... | ... | ... | "         | "       |
| Teign                             | ... | ... | ... | "         | "       |
| Umvukwe Flats                     | ... | ... | ... | 0·06      | "       |
| Melsetter—                        |     |     |     |           |         |
| Chikore                           | ... | ... | ... | 0·20      | 0·28    |
| Chipinga                          | ... | ... | ... | 0·88      | 0·18    |
| Helvetia                          | ... | ... | ... | 0·42      | —       |
| Melsetter                         | ... | ... | ... | Nil       | Nil     |
| Mount Selinda                     | ... | ... | ... | 0·59      | —       |
| Mutambara Mission                 | ... | ... | ... | Nil       | Nil     |
| Pasture                           | ... | ... | ... | "         | "       |
| Tom's Hope                        | ... | ... | ... | 0·11      | 0·23    |
| Vermont                           | ... | ... | ... | 0·34      | 1·19    |
| Salisbury—                        |     |     |     |           |         |
| Avondale                          | ... | ... | ... | 0·01      | Nil     |
| Brookmead                         | ... | ... | ... | Nil       | "       |
| Chishawasha                       | ... | ... | ..  | 0·11      | "       |
| Cleveland Reservoir               | ... | ... | ... | 0·01      | "       |
| Goromonzi                         | ... | ... | ... | Nil       | "       |
| Gwibi                             | ... | ... | ... | 0·36      | "       |
| Lilfordia                         | ... | ... | ... | 0·04      | —       |
| Meadows                           | ... | ... | ... | Nil       | Nil     |
| Salisbury Agricultural Laboratory | ... | ... | ... | "         | "       |
| „ (Club)                          | ... | ... | ... | 0·05      | "       |
| „ (Gaol)                          | ... | ... | ..  | 0·02      | "       |
| „ (Railway)                       | ... | ... | ... | Nil       | "       |

RAINFALL (*Continued*).

| STATION                 |     |     |     | September | October |
|-------------------------|-----|-----|-----|-----------|---------|
| MASHONALAND—(Continued) |     |     |     |           |         |
| Salisbury (Continued)   |     |     |     |           |         |
| Sebastopol              | ... | ... | ... | Nil       | Nil     |
| Selby                   | ... | ... | ... | "         | "       |
| Stapleford              | ... | ... | ... | 1·33      | —       |
| Westridge               | ... | ... | ... | 0·04      | —       |
| Umtali—                 |     |     |     |           |         |
| Chiconga's Location     | ... | ... | ... | 0·04      | —       |
| Odzani                  | ... | ... | ... | 0·01      | 0·03    |
| Penhalonga              | ... | ... | ... | Nil       | Nil     |
| Premier Estate          | ... | ... | ... | "         | 0·08    |
| Public School           | ... | ... | ... | "         | Nil     |
| Stralsund               | ... | ... | ... | 0·10      | "       |
| Summerfield             | ... | ... | ... | 0·14      | 0·12    |
| Umtali (Railway)        | ... | ... | ... | Nil       | Nil     |
| Utopia                  | ... | ... | ... | "         | 0·11    |
| Victoria—               |     |     |     |           |         |
| Chibi                   | ... | ... | ... | Nil       | Nil     |
| Chilimanzi              | ... | ... | ... | "         | "       |
| Chingombe               | ... | ... | ... | "         | "       |
| Chiredzi Ranche, Ndanga | ... | ... | ... | 0·06      | 0·04    |
| Clipsham                | ... | ... | ... | Nil       | Nil     |
| Eythorne                | ... | ... | ... | "         | 0·05    |
| Gokomere                | ... | ... | ... | "         | Nil     |
| Gutu                    | ... | ... | ... | "         | "       |
| Hanyanya (Bikita)       | ... | ... | ... | 0·08      | 0·24    |
| Makorsi River Ranche    | ... | ... | ... | 0·01      | 0·33    |
| Marthadale              | ... | ... | ... | Nil       | Nil     |
| Morgenster              | ... | ... | ... | 0·02      | 1·03    |
| Ndanga                  | ... | ... | ... | Nil       | 0·22    |
| Noeldale                | ... | ... | ... | "         | Nil     |
| Pamushana               | ... | ... | ... | "         | 0·20    |
| Silver Oaks             | ... | ... | ... | "         | 0·02    |
| Victoria                | ... | ... | ... | "         | Nil     |
| MATABELELAND :          |     |     |     |           |         |
| Belingwe—               |     |     |     |           |         |
| Albany                  | ... | ... | ... | Nil       | Nil     |
| Anglo-French Block      | ... | ... | ... | "         | 0·01    |
| Filabusi                | ... | ... | ... | "         | Nil     |
| Fort Rixon              | ... | ... | ... | "         | "       |
| Infiningwe              | ... | ... | ... | "         | "       |
| Insiza (Railway)        | ... | ... | ... | "         | "       |
| Shangani (Railway)      | ... | ... | ... | "         | "       |
| Tamba                   | ... | ... | ... | "         | "       |
| Thornville              | ... | ... | ... | "         | "       |
| Bubi—                   |     |     |     |           |         |
| Inyati                  | ... | ... | ... | Nil       | Nil     |
| Leighton                | ... | ... | ... | "         | "       |
| Lochard Experiment Farm | ... | ... | ... | "         | "       |

RAINFALL (*Continued*).

| STATION                     |     |     |     | September | October |
|-----------------------------|-----|-----|-----|-----------|---------|
| MATABELELAND—(Continued)    |     |     |     |           |         |
| Bulalima—                   |     |     |     |           |         |
| Figtree                     | ... | ... | ... | Nil       | Nil     |
| Mholi (late Magot)          | ... | ... | ... | "         | "       |
| Marula                      | ... | ... | ... | "         | "       |
| Solusi                      | ... | ... | ... | "         | "       |
| Syringa                     | ... | ... | ... | "         | 0·15    |
| Bulawayo—                   |     |     |     |           |         |
| Balla Balla (Railway)       | ... | ... | ... | Nil       | Nil     |
| Bembesi (Railway)           | ... | ... | ... | "         | "       |
| Braemar                     | ... | ... | ... | "         | "       |
| Essexvale                   | ... | ... | ... | "         | "       |
| Gwaai (Railway)             | ... | ... | ... | "         | "       |
| Heany Junction (Railway)    | ... | ... | ... | "         | "       |
| Hope Fountain               | ... | ... | ... | "         | "       |
| Imbesu Kraal                | ... | ... | ... | "         | "       |
| Keendale                    | ... | ... | ... | "         | "       |
| Khami                       | ... | ... | ... | "         | "       |
| Lower Rangemore             | ... | ... | ... | "         | "       |
| Matopo Mission              | ... | ... | ... | "         | "       |
| Maxim Hill                  | ... | ... | ... | "         | "       |
| Melinakanda Junction        | ... | ... | ... | "         | "       |
| Nyamandhlovu (Railway)      | ... | ... | ... | "         | "       |
| Observatory                 | ... | ... | ... | "         | "       |
| Pendennis                   | ... | ... | ... | "         | "       |
| Raylton                     | ... | ... | ... | "         | "       |
| Rhodes Matopo Park          | ... | ... | ... | "         | "       |
| Umgusa                      | ... | ... | ... | "         | "       |
| Umkien                      | ... | ... | ... | "         | "       |
| Gwanda—                     |     |     |     |           |         |
| Antelope Mine               | ... | ... | ... | Nil       | Nil     |
| Gwanda (Gaol)               | ... | ... | ... | "         | "       |
| " (Railway)                 | ... | ... | ... | "         | "       |
| Malundi                     | ... | ... | ... | "         | "       |
| Mtshabzi Mission            | ... | ... | ... | "         | "       |
| West Nicholson (Railway)    | ... | ... | ... | "         | "       |
| Gwelo—                      |     |     |     |           |         |
| Globe and Phoenix (Railway) | ... | ... | ... | Nil       | Nil     |
| Gwelo (Gaol)                | ... | ... | ... | "         | "       |
| Gwelo (Railway)             | ... | ... | ... | "         | "       |
| Lalapanzi                   | ... | ... | ... | "         | "       |
| Lochiel                     | ... | ... | ... | "         | "       |
| Lower Gwelo                 | ... | ... | ... | "         | "       |
| Que Que                     | ... | ... | ... | "         | "       |
| Rhodesdale Estate           | ... | ... | ... | "         | "       |
| Selukwe (Railway)           | ... | ... | ... | "         | "       |
| Shawlands                   | ... | ... | ... | "         | "       |
| Sheltered Vale              | ... | ... | ... | "         | "       |
| Sikombela                   | ... | ... | ... | "         | "       |
| Mafungabusi—                |     |     |     |           |         |
| Inyoka                      | ... | ... | ... | Nil       | Nil     |



RAINFALL (*Continued*)

| STATION                  |     |     |     | September | October |
|--------------------------|-----|-----|-----|-----------|---------|
| MATABELELAND—(Continued) |     |     |     |           |         |
| Mangwe—                  |     |     |     |           |         |
| Empandeni                | ... | ... | ... | Nil       | Nil     |
| Garth                    | ... | ... | ... | "         | "       |
| Tuli—                    |     |     |     |           |         |
| Lamulas                  | ... | ... | ... | Nil       | Nil     |
| Langalanga               | ... | ... | ... | "         | "       |
| Makalali                 | ... | ... | ... | "         | "       |
| Manantji                 | ... | ... | ... | "         | "       |
| Manyoni                  | ... | ... | ... | "         | "       |
| Mazunga                  | ... | ... | ... | "         | "       |
| Tuli                     | ... | ... | ... | "         | "       |
| Wankies—                 |     |     |     |           |         |
| Malindi (Railway)        | ... | ... | ... | Nil       | Nil     |
| Victoria Falls           | ... | ... | ... | "         | "       |
| Victoria Falls (Railway) | ... | ... | ... | "         | "       |
| Wankies Hospital         | ... | ... | ... | "         | "       |
| Wankies (Railway)        | ... | ... | ... | "         | "       |

— No return.

# Dates of Meetings of Farmers' Associations, Southern Rhodesia

(SUBJECT TO ALTERATION)

DATES OF MEETINGS OF FARMERS' ASSOCIATIONS.

1211

| Name of Association                   |    | Place of Meeting                | Secretary            | 1914-15  |             |          |
|---------------------------------------|----|---------------------------------|----------------------|----------|-------------|----------|
|                                       |    |                                 |                      | December | January     | February |
| Bindura                               | .. | Bindura ..                      | A. M. Robb           | ..       | ..          | ..       |
| Charter—Mgezi                         | .. | Beatrice Mine                   | W. Krienke           | 30       | 27          | 24       |
| Central                               | .. | Umvuma ..                       | N. Dainty            | 25       | 29          | 26       |
| Enterprise                            | .. | Arecutus Hotel                  | J. Watson            | 8        | 12          | 9        |
| Felixburg                             | .. | Umvuma ..                       | E. C. Boardman       | 26       | 30          | 27       |
| Figtree Branch, R.L. and F.A.         | .. | Figtree Hotel                   | A. Curtis            | ..       | ..          | ..       |
| Gatooma                               | .. | Gatooma ..                      | ..                   | 19       | 16          | 20       |
| Gazaland                              | .. | Chippinga ..                    | W. Wood              | ..       | 28          | ..       |
| Greystone                             | .. | Rooderheuvcl, Shangani          | J. W. Spencer        | 12       | 9           | 13       |
| Hartley                               | .. | Hartley ..                      | H. Savory            | 5        | 9           | 6        |
| Headlands                             | .. | Headlands ..                    | H. Barnes Pope       | ..       | ..          | ..       |
| Hunter's Road Farmers and Stockowners | .. | Hunter's Road Siding            | R. W. Twilley        | 12       | 9           | 13       |
| Insiza                                | .. | Insiza Station Hotel            | N. C. St. J. Breslin | ..       | ..          | ..       |
| Iron Mine Hill Proper                 | .. | Iron Mine Hill                  | T. Irving            | 12       | 15          | 13       |
| Lalapanzi and Iron Mine Hill          | .. | Iron Mine Hill                  | Cyril Allen          | 18       | 16          | 20       |
| Louagundi                             | .. | Sinoia ..                       | W. Abbott            | 19       | ..          | ..       |
| Macheke                               | .. | Macheke ..                      | H. H. Kidson         | ..       | 2           | ..       |
| Makwiro                               | .. | Makwiro ..                      | F. R. McLellan       | 18       | 15          | 19       |
| Mandellas                             | .. | Mandellas Farmers' Hall         | E. P. de Kock        | 5        | 2           | 6        |
| Mangwendi                             | .. | Fixed every meeting             | Luke Green           | ..       | 6           | ..       |
| Makoni                                | .. | Rusape ..                       | J. A. Tapson         | 5        | 2           | 6        |
| Marula                                | .. | Marula Siding                   | Mac. W. Ingram       | 26       | 23          | 27       |
| Mashonaland                           | .. | Commercial Hotel, Salisbury     | W. H. Williamson     | 12       | 9           | 13       |
| Matopo Branch, R.L. and F.A.          | .. | Malundi Hotel                   | W. Bathurst          | ..       | ..          | ..       |
| Mazoe                                 | .. | Glendale Siding                 | R. Newett            | ..       | 13          | 10       |
| Melsetter (North) ..                  | .. | Various farms                   | Rev. R. Wodehouse    | 5        | 9           | 13       |
| Midlands                              | .. | Gweio ..                        | C. H. B. Mercer      | 12       | ..          | ..       |
| Northern                              | .. | Farm "Summerfield"              | R. V. H. Blurton     | ..       | ..          | ..       |
| Northern Untali                       | .. | Norton Siding and various farms | C. E. Idle           | 4        | 16          | 20       |
| Norton and District                   | .. | Globe and Phoenix Hotel         | E. E. Somerset       | 19       | 29          | 26       |
| Que Que                               | .. | Library Buildings, Bulawayo     | H. S. Hopkins        | 25       | dates fixed | ..       |
| Rhodesian Landowners and Farmers      | .. | Shamva ..                       | J. M. Moubray        | 6        | 3           | ..       |
| Shamva                                | .. | Peggy Hotel, Insiza             | W. J. B. Harris      | ..       | ..          | ..       |
| Southern Insiza                       | .. | Setukwe ..                      | F. S. Clark          | ..       | ..          | ..       |
| Selukwe                               | .. | Fairview ..                     | G. B. Botha          | ..       | ..          | ..       |
| Somabula and Shangani Flats           | .. | Various farms                   | Hon. J. S. Parker    | ..       | ..          | ..       |
| Umvukwe                               | .. | Christmas Pass Hotel            | J. S. Holland        | 5        | 2           | 6        |
| Untali                                | .. | Victoria ..                     | H. S. Hoatson        | 16       | ..          | ..       |
| Victoria                              | .. | Vungu ..                        | J. H. Erasmus        | 10       | ..          | ..       |
| Vungu                                 | .. | Plumtree Hotel                  | A. Barclay           | 12       | 9           | 13       |
| Western                               | .. | ..                              | ..                   | ..       | ..          | ..       |

## Departmental Notices.

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### Information for Farmers

The Department of Agriculture is prepared to furnish to farmers technical advice either by correspondence, or, where possible, by personal visits. All communications should be addressed in the first instance to the Director of Agriculture.

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### Crops

The Agricultural Branch deals with enquiries relating to agricultural practice, soils, crops, cultural operations, processes, seeds, trees, farm implements and machinery, etc.

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### Disposal of Pure Seed.

Farmers devoting special attention to the production of pure seed of any locally grown crops are invited to communicate with the Government Agriculturist, and at the same time to submit a  $\frac{1}{4}$  lb. sample of any seed which they may have for disposal.

In addition to indicating the total amount of seed offered and the price f.o.r. the nearest railway station or siding, the correct name of the variety and the origin of the seed from which the crop was grown should be given. In the case of special attention having been devoted to seed selection, the methods employed should be described.

Where these stipulations are complied with, and the samples forwarded are deemed by the Agriculturist of sufficiently high quality for seed purposes, growers and intending purchasers will be put in touch with one another. It is hoped by this means to encourage the production of pure seed, and growers are urged whenever possible to sell their seed under guarantee of trueness to name, type and sample deposited with the Department.



After placing growers and would-be purchasers in touch with one another, the Department can accept no further responsibility except in the position of adjudicator when bulk supplies are thought inferior to sample and description, in which case both parties will be required to abide by the decision of the Department.

For further particulars see article on Pure Seed Supply, *Rhodesia Agricultural Journal*, February, 1914.

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### Poisonous Plants

It is of great importance that as soon as possible a study should be made of those plants found in Southern Rhodesia which are poisonous or deleterious to small or large stock. Farmers and others who have known, or suspected poisonous plants on their property, are requested to communicate with the Government Agriculturist and Botanist, Department of Agriculture, Salisbury, at the same time forwarding specimens of the plant, including stem, leaves, flowers, and, where possible, fruit. Any particular regarding the habits of the plant will be welcomed, and in return the Department will supply all available information regarding the plants.

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### Live Stock

The Animal Industry Branch is prepared to advise with regard to all matters connected with stock breeding, selection feeding and registration of stud animals, the dairy industry, poultry management, farm buildings for stock, and kindred subjects. Buyers and sellers of stud stock in Rhodesia are also put in touch with one another.

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### Entomology

The Government Entomologist advises on matters connected with insect pests of live stock, crops, and fruit trees, and also undertakes the inspection of nurseries and of the importation of plants from abroad.

## Chemical Analyses

The Government Agricultural Chemist deals with matters relating to the composition of soils, fertilisers, farm produce of vegetable or animal origin; also the investigation of poisons and of articles of potential economic value.

Nominal charges are made, which, while not covering the cost, will help to defray the expense and serve as a proof of good faith. Samples, carriage prepaid, together with full particulars regarding the subject should be addressed to the Agricultural Chemist, Department of Agriculture, Salisbury.

A schedule of charges and directions for taking samples will be furnished on application.

With all analyses, reports will be furnished explanatory of the results and, when possible, advice given as to the nature, properties and value of the material.

No charge will be made for analysis where the material forwarded is considered by the Director of Agriculture and Chemist to be of sufficient general interest.

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## Services of Government Veterinary Surgeons

1. The services of Government Veterinary Surgeons are available to the public, free of charge, for the following purposes only :—

- (1) Attending and giving professional advice in connection with the following diseases, viz. :—Anthrax, Contagious abortion, East Coast Fever, Epizootic Lymphangitis, Foot and Mouth Disease, Farcy, Foot-rot, Heartwater, Glanders, Intestinal parasites amongst sheep and goats, Liver Disease, Lungsickness, Osteo Porosis, Malarial Catarrhal Fever (blue tongue), Rabies, Redwater, Rinderpest, Scabies, Sponziekte (quarter evil), Swine Fever, and any other diseases which may in future be scheduled in terms of section 3, sub-section 18 of the "Animals Diseases Consolidation Ordinance, 1906." Attending to cases of disease amongst live stock which, though not of a contagious or infectious character, may be of general public importance.

(2) Applying tests in regard to Glanders, Tuberculosis, or any other disease against the introduction or spread of which tests are applied under regulations.

(3) Inoculations against the following diseases :—

Horsesickness, Lungsickness, Anthrax, Quarter Evil, Redwater, Malarial Catarrh! Fever (blue tongue). A fee to cover the cost of serum and virus will be charged.

2. The following charges shall be made and payable for services rendered by the Government Veterinary Surgeons in other cases, viz. :—

|   | £ | s. | d. |
|---|---|----|----|
| (1) For every professional visit within three miles of his office or residence ... ..   | 0 | 5  | 0  |
| (2) For every professional visit beyond such distance ... ..<br>plus an additional charge of 2/6 per hour whilst engaged in such visits or £2/2/0 a day of 24 hours ; | 0 | 10 | 6  |
| (3) For advice given at the Veterinary Surgeon's office, for each animal, per visit   | 0 | 2  | 6  |
| (4) The following to be charged in addition to visiting fees :—   |   |    |    |
| a. For every examination as to soundness, each ... ..   | 1 | 1  | 0  |
| b. For castration, horses, each ... ..  | 1 | 1  | 0  |
| c. For castration, bulls, each ....   | 0 | 5  | 0  |
| d. For castration, donkeys, each.. ...  | 0 | 10 | 6  |
| e. For parturition cases, mares, each   | 2 | 2  | 0  |
| f. For parturition cases, cows, each..  | 1 | 1  | 0  |
| g. For other operations, according to nature, from 5/- to £2/2/0.   |   |    |    |

3. Double the above fees will be payable for services rendered on Sundays, public holidays, and between the hours of 7 p.m. and 7 a.m.

4. Applicants for the services of Government Veterinary Surgeons must at their own cost provide the necessary transport for the conveyance of these officers from, and back to, their residence or nearest railway station.

5. Farmers and owners of stock throughout the country frequently telegraph for a Government Veterinary Surgeon to



be sent to attend an animal which has been taken seriously ill. It is rarely possible to comply with these requests at once, as the Veterinary Surgeon may be engaged on duty which he cannot leave, or is at such a distance from where his services are required that he can hardly be expected to arrive in time to be of any service in an urgent case. Hence much valuable time is wasted, the owner of the animal is dissatisfied, and the veterinary staff discredited. To obviate this, in all cases where veterinary advice and assistance are required, the owner should telegraph to "Veteran," Salisbury, with prepaid reply, the nature of the complaint that the animal is suffering from, giving as full and accurate a description of the symptoms as possible. This will enable the Chief Veterinary Surgeon to telegraph advice at once and state whether he is able to arrange for veterinary attendance on the case or not, and save valuable time, which is always of importance in acute cases.

6. The services of Government Veterinary Surgeons will only be available for private work with the consent of such officers, and when such work does not interfere with their official duties, or when the services of a private practitioner are not available.

7. As the arrangement of allowing Government Veterinary Surgeons to attend to private cases is intended purely for the benefit of farmers and stock-owners who may wish to obtain professional advice, no responsibility whatever will be accepted for any loss of stock, etc., which may result from the negligent treatment or advice, or wilful default, of any Government Veterinary Surgeon.

8. All fees collected in terms of these Regulations are payable to the Treasury through the local Receiver of Revenue.

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## Irrigation

From the Agricultural Engineer assistance may be obtained by farmers for the following :—

1. In the locating of possible irrigation projects.
2. In the preparation of surveys or plans and for irrigation works, including weirs, dams, furrows, pumping plants, and determining the extent of land which

may be brought under irrigation schemes, together with rough estimates of costs.

3. In the supervision of construction and carrying out of projects.
4. In the selection of suitable sites for boring operations.
5. Preparing specifications, etc., regarding pumping plants, windmills, and agricultural machinery.
6. Giving general advice on cognate subjects.

Informal advice of a general character will be given to applicants making enquiry by letter or in person. Any applicant desiring professional assistance likely to occupy more than one day should apply for advice in writing. All applicants should specify clearly the nature of the project on which they seek advice, and should give full particulars as to the distance and direction of their farms from some well-known centre. Applicants will be required to provide suitable means of transport for the officer concerned during the period devoted to work on the spot; to provide any unskilled labour that may be required; and to provide for any other contingent services. Applications should be addressed to the Director of Agriculture, who will endeavour to arrange visits as far as possible in order of application, but with due regard to situation, in order to obviate unnecessary travelling and delay. The services of the Agricultural Engineer are given free, but in cases demanding prolonged individual attention, or repeated supervision, a charge may be made according to circumstances.

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## Samples

In connection with enquiries, especially with regard to diseases amongst crops, insect pests, soils, grain and the identification of plants, specimens should, wherever possible, be sent, together with full details. It is found that such parcels are often forwarded without any indication of where they are from or why they were sent and it is difficult in such cases to trace the sender. It is, therefore, requested that persons when forwarding samples for examination, indicate clearly their names and address on the package, so as to enable their requirements to be attended to without delay.

## Charges for Dipping Cattle at Government Dipping Tanks.

A charge of 1d. per head is made in respect of all cattle dipped at Government dipping tanks.

Unweaned calves will be dipped free of charge.

Payment may be made in cash or by means of books of coupons at £1, 10/- and 2/6, which can be obtained from Civil Commissioners, Native Commissioners, or through all Veterinary Surgeons and Cattle Inspectors.

The tanks to which these provisions at present apply are the following :—

Salisbury (3), Bulawayo (3), Inyati, Umtali, Penhalonga, Melsetter, Marandellas, Macheke, Mazoe, Lomagundi, Hartley, Gwelo, Selukwe, Enkeldoorn, Victoria, Gwanda, Gatooma, Que Que, Umvuma, Kimberley Reefs.

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## Lectures for Farmers

The services of certain of the officers of the Department of Agriculture and the Veterinary Department are available for purposes of delivering lectures on subjects upon which they have special knowledge. As far as practicable, lectures will be accompanied by demonstrations at the time or subsequently in the field. Owing to the many calls on the time of the staff and the exigencies of their duties, alternative dates are desirable in order to avoid disappointment. The following topics are offered as examples of subjects that may be dealt with in this manner, but the suggestion of other themes is invited.

*Agriculture.*—Maize growing; Maize selection and maintenance of the breeding plot; Points of maize and maize judging, with demonstrations; Utilisation of granite vlei soils; Ground nut culture; Rotation crops for home use and for sale; Veld improvement by winter grasses; Production of foodstuffs for the mines; Ensilage; Fungoid diseases of maize and wheat; Wheat, oats and lucerne under irrigation; The prospects of cotton culture in Southern Rhodesia.

*Veterinary Hygiene.*—Detection and prevention of disease; The care of live stock.



*Live Stock.*—Judging of cattle according to breeds, and for beef, milk and draught; feeding and kraaling of live stock; general principles of cattle breeding; management of imported stock; grading up of native or local stock with pure bred bulls.

*Dairying.*—Home butter-making; building and equipment of a farm dairy; handling and marketing of milk; packing and marketing of butter; construction of cow houses.

*Swine Husbandry.*—Breeding and feeding of swine; some suggestions for the production of first-class bacon pigs; construction of piggeries at moderate cost.

*Chemistry.*—The principles of soil fertility; the principles of manuring; the value of lime in agriculture; chemistry of milk and its products (accompanied by demonstrations in milk-testing).

*Entomology.*—Economic entomology on the farm; the role of insects and their allies in the transmission of disease; scale insects and fruit trees and methods for their control; insect pests and maize; enemies of the potato, insect and fungus; the value and objects of plant import and nursery regulations.

*Irrigation.*—Methods of applying water to land for irrigation; the measurement of water in connection with irrigation; canal irrigation; storage reservoirs; hints on the selection of sites and on the design of earthen and other dams; irrigation by pumping, with notes on the selection of plants.

Enquiries and invitations should in the first instance be addressed to the Director of Agriculture, Salisbury.

### Forestry—Sale of Trees

The undermentioned varieties of trees will be available for sale as from December and onwards:—

*Casuarina leptoclada*—Beefwood.

*Cedrela toona*—Indian toona.

*Callitris calcarata*—Cypress pine.

*Callitris robusta*—Murray pine.

*Cupressus arizonica*—Arizona cypress.

do. *horizontalis*—Common cypress.

do. *pyramidalis*—Common pyramidal cypress.

do. *lusitanica*—Portuguese cypress.

do. *torulosa*—Himalayan cypress.

*Dalbergia sissoo*—Indian sissoo.

*Eucalyptus amygdalina*—Peppermint gum.

do. *botryoides*—Bastard mahogany gum.

do. *calophylla*—Calophylla gum.

do. *citriodora*—Lemon-scented gum.

do. *corynocalyx*—Sugar gum.

do. *longifolia*—Woolly butt gum.

do. *microtheca*—Coolibah gum.

do. *microcorys*—Tallow wood gum.

do. *paniculata*—Red ironbark gum.

do. *resinifera*—Red mahogany gum.

do. *robusta*—Swamp mahogany.

do. *rostrata*—Rostrata gum.

do. *saligna*—Saligna gum.

do. *tereticornis*—Red gum.

do. *siderophloia*—Broad leaved ironbark.

do. *sieberiana*—Mountain ash gum.

*Grevillea robusta*—Silk oak.

*Jacaranda mimosæfolia*—Jacaranda.

*Pinus densiflora*—Akamatsu pine.

do. *halepensis*—Aleppo pine.

do. *longifolia*—Cheer pine.

*Thuja orientalis*—Arbor vitæ.

do. *gigantea*—Large arbor vitæ.

Prices are as follows:—

Orders up to 1,000, at 8s. 4d. per 100, tins included.

Orders from 1,000 to 5,000, at 6s. per 100, tins to be provided or returned.

Orders of over 5,000, at 5s. per 100, tins to be provided or returned.

All prices are f.o.r. Salisbury, and trees are in tins weighing about 25lbs. each. There are also a limited number of larger trees, 4 in a tin, at 3d. per tree. Ornamental shrubs, 6d. and 1s. each, generally 4 in a tin. *Dalbergia sissoo* seed at 6d. per oz. *Foureroya gigantea* (Mauritius hemp) bulbels, at 1s. per 100; Sisal hemp bulbels, at 3s. per 100; *Paspalum*, 5s. per 1,000.

Applications, together with remittance and full particulars regarding forwarding, should be addressed to the Agriculturist and Botanist, Department of Agriculture, Salisbury.

## Departmental Bulletins

The following Bulletins, consisting of reprints of articles which have appeared in this Journal, are available for distribution free of charge to applicants in Rhodesia :—

### AGRICULTURE.

- No. 2. The Possibilities of Rhodesia as a Citrus Growing Country, by R. McIlwaine, M.A., LL.B.
- No. 61. Requirements in sending Botanical Specimens to the Department for Identification.
- No. 62. Services of Agricultural Engineer.
- No. 64. Hints on Irrigation—Small Gravitation Schemes, by W. M. Watt.
- No. 81. Possibilities of Export Trade in Oil Seeds, by H. Godfrey Mundy, F.L.S.
- No. 90. Reports on Experiments—Experimental Station, Salisbury, 1910-1911, by J. H. Hampton.
- No. 94. Second Report on Experiments, by J. H. Hampton.
- No. 125. Subterranean Water, by W. M. Watt.
- No. 137. Drainage for Irrigated and Swampy Land, by W. M. Watt.
- No. 153. Citrus Fruit Trees—From Seed to Grove.
- No. 155. The Manuring of Maize on the Government Experimental Farm, Gwebi, 1912-13.
- No. 156. Elephant Grass or Napier's Fodder, by J. A. T. Walters, B.A.
- No. 160. Hints on Irrigation—Pumping Plants, by W. M. Watt, Agricultural Engineer.
- No. 164. Citrus Fruits in Rhodesia—Suggestions as to where to Plant, by C. E. Farmer.
- No. 166. Rhodesian Citrus Fruits—Exportation to London.
- No. 173. Citrus Fruits: Cultivation and Pruning, by C. E. Farmer.
- No. 177. Notes on the Raising of Seedling Trees, by F. B. Willoughby.
- No. 182. Some Citrus Growing Experiences in Rhodesia, by R. McIlwaine, M.A., LL.B.
- No. 185. Citrus Fruits—The Preparation of Oranges for Market, by C. E. Farmer.
- No. 189. The Manuring of Maize on the Government Experiment Farm, Gwebi, by G. N. Blackshaw, B.Sc., F.C.S.
- No. 192. A Calendar of Crop Sowings, by H. Godfrey Mundy, F.L.S.
- No. —. Orange and Lemon Growing in Southern Rhodesia, by R. McIlwaine.
- Tree Culture in Southern Rhodesia, by P. B. S. Wrey, A.M.I.C.E.

### CROPS.

- No. 88. Chicory Growing, by H. Godfrey Mundy, F.L.S.
- No. 106. Cultivation and Preparation of Ginger.
- No. 126. Turkish Tobacco.
- No. 128. Paspalum, by J. A. T. Walters, B.A., Assistant Agriculturist and Botanist.
- No. 132. Sumatra Tobacco, Hints to Rhodesian Growers, by C. J. Sketchley.
- No. 133. Tobacco Culture (Virginia)—Planting, Cultivation, Fertilising, Priming, Topping, Suckering, Ripening.
- No. 138. Tobacco Culture (Virginia)—Harvesting and Curing.
- No. 162. Rhodesian Maize: The Principal Types and their Points, by J. A. T. Walters, B.A., Assistant Agriculturist.
- No. 170. Production of Pedigree Seed—Maize, by H. Godfrey Mundy, F.L.S.



- No. 174. Notes on Hop Growing, by H. Godfrey Mundy, F.L.S.
- No. 175. Notes on Lucerne, by H. Godfrey Mundy, F.L.S.
- No. 176. The Cultivation of Castor Oil Beans, by H. Godfrey Mundy, F.L.S.
- No. 179. Buckwheat, by H. G. Mundy, F.L.S.
- No. 181. Sunflower Cultivation, by H. G. Mundy, F.L.S.
- No. 188. The Ground-Nut or Monkey Nut, by H. Godfrey Mundy, F.L.S.
- No. 193. Oats in Southern Rhodesia, by H. Godfrey Mundy, F.L.S.
- No. 194. Rye, by J. A. T. Walters, B.A.

#### ENTOMOLOGY AND VEGETABLE PATHOLOGY.

- No. 58. Onion Thrips, by R. W. Jack, F.E.S.
- No. 75. Fumigation of Fruit Trees with Hydrocyanic Acid Gas, by R. W. Jack, F.E.S.
- No. 100. Tsetse—Preliminary Notes on the Habits of—by R. W. Jack, F.E.S.
- No. 139. Termites, or "White Ants," by Rupert W. Jack, F.E.S.
- No. 140. Insect Pests of Tobacco in Southern Rhodesia, by R. W. Jack, F.E.S.
- No. 142. The Bean Stem Maggot, by R. W. Jack, F.E.S.
- No. 147. Root Gallworm, by R. W. Jack, F.E.S.
- No. 148. Darkling Beetle Grubs Injurious to Tobacco, by R. W. Jack, F.E.S.
- No. 151. Potato Spraying Experiments for the Control of Early Blight, by Rupert W. Jack, F.E.S.
- No. 154. Borers in Native Timber—Results of Experiments with Preservatives, by Rupert W. Jack, F.E.S.
- No. 158. Two Ladybirds Injurious to Potato Plants, by R. W. Jack, F.E.S.
- No. 171. The Cabbage Web-Worm—A Pest of Cabbage and Allied Plants, by R. W. Jack, F.E.S.
- No. 172. Diseases of the Potato Tuber and the Selection of Sound Seed, by R. W. Jack, F.E.S.
- No. 187. The Dusty Surface Beetle, by Rupert W. Jack, F.E.S.

#### VETERINARY.

- No. 50. Epizootic Abortion in Cattle, by Ll. E. W. Bevan, M.R.C.V.S.
  - No. 51. Strangles, by F. D. Ferguson, M.R.C.V.S.
  - No. 53. Animals Diseases Consolidation Ordinance, 1904.
  - No. 77. Animals Diseases Amending Ordinance, 1911.
  - No. 84. African Coast Fever—Diagnosis of Gland Puncture, by Ll. E. W. Bevan, M.R.C.V.S.
  - No. 95. Oestrus-ovis in Sheep, by Alec King.
  - No. 103. Dipping and Tick-Destroying Agents, by Lt.-Col. H. Watkins-Pitchford.
  - No. 121. Rabies, by Ll. E. W. Bevan, M.R.C.V.S., and T. G. Millington, M.R.C.V.S., D.V.H.
  - No. 180. Note on the Treatment of Biliary Fever of the Horse with Trypan Blue, by Ll. E. W. Bevan, M.R.C.V.S.
  - No. 191. Scab or Scabies in Sheep and Goats, by Rowland Williams, M.R.C.V.S.
  - No. 195. Some Notes on the Systematic Dipping of Stock, by C. R. Edmonds, Assistant Chief Veterinary Surgeon, and Ll. E. W. Bevan, Government Veterinary Bacteriologist, Southern Rhodesia.
- Conditions under which Government Veterinary Surgeons' Services are available to the public.

## LIVE STOCK.

- No. 96. Swine Breeds and Breeding of, by Loudon M. Douglas, F.R.S.E.  
 No. 123. Feeding and Care of Imported Bulls, by R. C. Simmons.  
 No. 145. Prospects for Importation of Cattle from Australia, by Eric A. Nobbs, Ph.D., B.Sc.  
 No. 161. Notes on Cattle Breeding, Part III., by R. C. Simmons.  
 No. 163. Feeding and Care of Imported Cattle, by R. C. Simmons.  
 No. 167. The Construction of Dipping Tanks for Cattle.  
 No. 169. The Breeding and Feeding of Pigs for Bacon Factory Purposes, by R. C. Simmons.

## MISCELLANEOUS.

- No. 93. Formation of Agricultural Credit Associations in Rhodesia, by Loudon M. Douglas, F.R.S.E.  
 No. 119. Some Notes on Charcoal Burning, by Eric A. Nobbs, Ph.D., B.Sc.  
 No. 129. How to Make Use of the "Fencing Ordinance, 1904," by N. H. Chataway.  
 No. 134. Plans and Specifications for Flue Curing Tobacco Barns.  
 No. 141. Dry Season and Droughts in Rhodesia, by Rev. E. Goetz, S.J.  
 No. 144. Rhodesian Tobacco—Prospects of an Australian Market, by Eric A. Nobbs, Ph.D., B.Sc.  
 No. 150. Dry Season and Droughts in Rhodesia, by the Rev. E. Goetz, S.J.  
 No. 152. A School of Agriculture for Southern Rhodesia, by Eric A. Nobbs, Ph.D., B.Sc., Director of Agriculture.  
 No. 157. Hints on Brickmaking, by G. T. Dyke.  
 No. 159. Gwelo Creamery: Hints and Suggestions to Farmers, by W. G. Elliott.  
 No. 163. Report on the Methods of Growing, Curing and Selling Bright Tobacco in Virginia, U.S.A., by H. Kay Scorrer.  
 No. 183. The Rainy Season in Southern Rhodesia, by the Rev. E. Goetz, S.J.  
 No. 184. Cream—Its Separation, Handling and Sale to Butter Factories, by R. C. Simmons.  
 No. 186. Concrete and Reinforced Concrete, by E. Hardcastle, M.I.E.E.  
 Health and Clothing.  
 Malaria: its History, Prevention and Cure, by A. M. Fleming, C.M.G., M.B., F.R.C.S. (Ed.), D.P.H. (Camb.), Medical Director.  
 Game Law: Summary of.  
 Terms for Analysis by the Department of Agriculture, of Produce, Soils, Water, etc.

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**HANDBOOK OF TOBACCO CULTURE** for  
 Planters in Southern Rhodesia. Sold by the Department of Agriculture. 2/6.

## Employment on Farms.

The Department of Agriculture receives numerous enquiries from persons of varied attainments, age and financial position for openings on farms, as managers, assistants and learners, requiring remuneration on corresponding scales, or willing to give services in return for keep.

In order that work may be found for the above and needs of farmers met, applications are invited from both employers and persons seeking employment. Applications are also invited from artisans, such as masons, bricklayers, carpenters, fencers, well sinkers, concrete workers, and the like who may desire work on farms. In cases where employers have obtained the labour they require, or applicants for employment have found work, it is requested that notification be at once sent to the Department of Agriculture, in order that unnecessary correspondence be avoided.

Replies to the following applications should be addressed to the initials of the advertisers, c/o Director of Agriculture, who will forward the letter to the party referred to.

### SITUATIONS VACANT.

T. S.—Man who understands mealie growing and capable of looking after and working cattle, to manage good farm in Lomagundi district. Half shares.

J. J. R.—Farm assistant. Furnish credentials stating experience, age and whether married.

R. C.—Manager for farm; half shares.

T. F.—Assistant or pupil for tobacco season. Board, lodging and percentage of crop.

### SITUATIONS WANTED.

L. R. H.—As farm manager or assistant. Thorough knowledge of agriculture, etc.; also dairying and cattle; practical knowledge of most farm work and well up in oil engines, etc. State salary.

J. L. D.—Scotsman (unmarried) as farm manager or such like; thorough experience of general agriculture. pure-bred and commercial stock; knowledge of building and concrete work; can keep in repair all farm implements. Satisfactory references from present and former employers.

C. R. I.—Assistant or farm pupil.

W. S. Y.—Colonial requires responsible position on farm; seven years' experience; thoroughly understands cattle, small stock and grain crops. Percentage of crops, etc., or salary.

C. H. C.—Late foreman of Government House, Bulawayo; well up in general farming, market gardening, fruit and forestry.



## Government Notices.

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No. 50 of 1912.]

[8th February, 1912.

(As amended by Nos. 329 and 383 of 1914.)

### AFRICAN COAST FEVER.

*Regulations regarding the movement of cattle and the prevention and suppression of disease.*

1. UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel and withdraw Government Notices Nos. 329 of 1910 and 308 of 1911 and make the following provisions in lieu thereof :—

2. The various districts of Southern Rhodesia are hereby declared an area infected with African Coast Fever for the purposes of section 5 (2) of the aforesaid Ordinance, and, save as hereinafter set out, all movement of cattle within the said districts is prohibited until further notice.

#### *General Movement.*

3. For the purpose of section 22 (1) of the said Ordinance, the following shall be regarded as places within the boundaries of which the movement of cattle may be allowed without special permission :—

(a) Single farm.

(b) An area occupied by an owner or lessee, under one management, comprising contiguous farms and situated within one cattle transport area. The mere possession by an owner or lessee of grazing rights over a contiguous farm or farms shall not constitute occupation of such farm or farms.

(c) An area the property of one owner.

(d) For grazing purposes, an area within a radius of four miles of native kraals situated on unalienated land or in reserves, save and in so far as such area includes any private land.

The sites of such kraals shall be deemed to be the places where they are situated at the date of promulgation of these regulations.

(e) An area under the management or control of any Municipality, Sanitary Board or Village Management Board.

4. Notwithstanding the provisions of the last preceding section, or of section 9 hereof, the Chief Inspector may, on the outbreak of disease, or for such other cause as may be deemed expedient, direct the isolation or quarantine of cattle on a limited area of the aforesaid places.

5. The movement of cattle from place to place may be permitted under the special permission, in writing, of an Inspector, Sub-Inspector, or other officer or person duly authorised by the Administrator to grant such permission.

6. No permission as aforesaid shall permit the movement of cattle—

(a) Without the written consent of the owners, occupiers or managers of occupied land, and in the case of native reserves, of the Native Commissioner of the district over which land or reserve such

cattle will pass, whether along roads or otherwise; provided, however, that refusal to grant such consent shall be in writing, and provided further that if the Controller of Stock or the Chief Inspector shall consider that such consent is withheld without good and sufficient cause he may permit of movement without such consent.

If any such person mentioned above refuse to give consent or to state a reason for refusing to do so in writing, no valid objection shall be deemed to exist and movement may be permitted without such written consent.

- (b) Within a veterinary district as defined in the Schedule annexed hereto from one transport area to or through another without the consent of the Cattle Inspector in charge of such area.
- (c) From any veterinary district to or through another without the consent of the District Veterinary Surgeon of such district.

#### *Slaughter Cattle.*

7. Cattle moved to any centre for slaughter under the provisions of these or any other regulations shall, on arrival, be immediately taken to such quarantine area (if any) as is provided for the purpose and immediately branded with the letters "V.D." on the near hip.

8. Cattle admitted to a quarantine area in terms of the last preceding section shall be slaughtered within twenty-one days of the date of admission, and shall not be permitted to leave the same except for the purpose of being slaughtered at the appointed abattoir, and if found outside such area, except for the said purpose, may be destroyed on the order of the Chief Inspector or Controller of Stock; provided, however, that the Chief Inspector may allow the removal of cattle from such an area under such conditions as he may prescribe.

#### *Transport Cattle.*

9. The use of cattle for draught purposes is prohibited except:—

- (1) Within the boundaries of the places defined in section 3 (a), (b) and (c) hereof.
- (2) Within the boundaries of areas already fixed for the use of cattle for draught purposes in terms of regulations published under Government Notice No. 329 of 1910, or such other areas as may be fixed by the Administrator.

10. Notwithstanding the provisions of section 9, no permit shall authorise the working of cattle

- (a) which are not clearly and distinctly branded with the registered brand of the owner;
- (b) in any wagon or vehicle which shall not have the owner's name and address legibly and permanently inscribed on the right side thereof.

11. No wagon or other vehicle drawn by oxen shall be moved from one cattle transport area into another without the permission of the Cattle Inspectors concerned, and under such conditions as they may impose.

#### *General Provisions.*

12. On the outbreak or suspected outbreak of disease, the Administrator may declare an area of infection around and embracing the place of outbreak or suspected outbreak, and a further area or areas around such area of infection as a guard area, whereupon all movement of cattle into and from place to place within such area or areas shall be immediately suspended, except as hereinafter provided.



A.—*In areas of infection and guard areas:—*

- (1) Cattle in transit by rail may be moved through such area.
- (2) Cattle from beyond the borders of Southern Rhodesia may be detained within such area or areas *en route* to destination.
- (3) Cattle for *bona fide* farming, dairy and slaughter purposes may be moved into such area or areas by permission of the Chief Inspector and under such conditions as he may impose.

B.—*In guard areas only:—*

Cattle may be moved into and from place to place within such area under the conditions of section 6 hereof.

13. The removal of green forage, hay, fodder, bedding reeds, manure or of such other articles as may be reasonably supposed capable of conveying infection, shall be prohibited from areas of infection, save and except with the special permission of the Administrator.

14. Whenever an area shall have been declared under section 12 hereof, every person within such area, or within such further area as may be specified by Government Notice, owning or in charge of cattle shall, upon the death or slaughter because of disease, suspected disease, or accident, of any such cattle, immediately report such occurrence through the nearest Cattle Inspector, Native Commissioner or Police Officer to the District Veterinary Surgeon.

15. Notwithstanding the provisions of these regulations, it shall be competent for the Chief Inspector of Cattle to authorise and direct the movement of cattle for the purposes of isolating, dipping, quarantine, or any other such objects as may be deemed necessary to prevent or suppress an outbreak of disease.

16. Whenever an area shall have been declared an area of infection or guard area in terms of section 12 hereof, any person who shall allow any cattle to stray or be otherwise removed, except as provided for in these regulations, from any one place within such area to another place, or from a place outside of to a place within such area, shall be guilty of an offence against these regulations.

17. All cattle within the limits of the various commonages and townlands, areas of infection and guard areas as declared under section 12 hereof, or depastured on common grazing ground, shall be dipped or sprayed at least once in every three days, unless the Chief Inspector shall authorise the extension of the time between such dipping or spraying, or the entire suspension of the same.

18. In all areas of infection and guard areas sheep and goats shall be dipped at such periods as may be directed by the Chief Inspector.

19. Whenever the owner, occupier, or manager of a farm shall adopt means of cleansing cattle running thereon, either by spraying, dipping, or by any other method, the Chief Inspector may order any natives or other persons having cattle on the same farm to cleanse such cattle, and the Native Commissioner of the district within which the farm is situated may enter into an arrangement with the native owners of cattle to cleanse such cattle at a charge to be mutually agreed upon between the said owner, occupier or manager and the said native owners.

20. All permits for the removal of cattle issued under the provisions of the said Ordinance or of any regulations framed thereunder shall specify legibly and clearly on the face thereof the place from and to which such cattle may be removed, the route by which they shall travel, the number and brands of such cattle, the time allowed for the journey, and such other particulars and conditions as it may be deemed expedient to provide.

21. No permit issued for the movement of cattle shall be taken to authorise any trespass in connection with such movement.

22. Notwithstanding the provisions of these regulations, it shall not be lawful for any owner of cattle to allow any such cattle to be on any road, public outspan, commonage, or any property other than that of the owner, unless they are free from ticks or unless they have been effectively cleansed



by dipping, spraying or other process, within fourteen days of being allowed on such road or other place. Any beast having ten or more ticks on it shall not be considered free from ticks.

23. Any person contravening the provisions of these regulations or the conditions set out in permits issued thereunder, shall, where no higher penalty has been by the said Ordinance or any other law provided, be liable in respect of each offence to a fine not exceeding £20, or in default of payment to imprisonment with or without hard labour for a period not exceeding three months.

#### SCHEDULE "A."

##### VETERINARY DISTRICTS OF SOUTHERN RHODESIA.

###### (1) *Salisbury.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912 :—

32. Battlefields; 33. Hartley and Gatooma; 34. Gadzema Station; 35. Makwiro Station; 36. Norton Siding; 37. Hunyani Tank; 38. 1645½ Peg B. & M. & R. Railways; 39. Salisbury A.; 40. Salisbury B.; 41. Salisbury C.; 42. Salisbury D.; 43. Arcturus; 44. Bromley; 45. Marandellas North; 46. Marandellas South; 48. Headlands Station; 49. Junction Mazoe and Lomagundi Railways; 50. 23-Mile Peg, Lomagundi Railway; 51. Passaford Station; 52. 35-Mile Peg, Lomagundi Railway; 53. Gwibi Tank Halt; 54. Banket, Lomagundi; 55. Eldorado, Lomagundi; 56. Selby Siding; 57. Mazoe; and 58. Kimberley Reefs.

###### (2) *Bulawayo.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912 :—

1. Plumtree; 2. Marula Siding; 3. Figtree; 4. Westacre Junction; 5. Bulawayo Area; 6. Heaney Junction; 7. Bembesi Station; 8. Insiza North; 9. Insiza South; 10. Shangani North; 11. Shangani South; 14. Redbank; 15. Nyamandhlovu Station; 16. Malindi Station; 17. Wankies Area; 18. Matetsi Siding; 19. Matopo Terminus; 20. Sabiwa Siding; 21. Gwanda Station; 22. West Nicholson; 23. Belingwe; 59. Essexvale and Balla Balla Areas; 60. Stanmore Siding Area; 61. Filabusi Area.

###### (3) *Gwelo.*

An area comprising the following areas for transport cattle published under Government Notice No. 11 of 1912 :—

12. Somabula Siding; 13. Gwelo Station; 24. Selukwe Area; 25. Surprise Area; 26. Indiva Siding; 27. Lalapanzi; 28. Iron Mine Hill Siding; 29. Umvuma Siding; 31. Que Que Station.

###### (4) *Umtali.*

An area comprising the native districts of Umtali, Melsetter, Makoni and Inyanga.

No. 24 of 1914.]

[14th January, 1914.

(As amended by Nos. 207 and 395 of 1914.)

#### AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel Government Notices Nos. 82, 129, 143, 258, 297 and 326 of 1913, and, in terms of section 12 of Government Notice No. 50 of 1912, declare the following areas of infection and guard areas :—

##### (2) NATIVE DISTRICT OF SALISBURY.

###### (a) *Areas of Infection.*

- (1) Hatfield Estate and Hatfield Plots.
- (2) Salisbury Commonage.
- (3) M.T.C., Gallagher's Lease and Makabusi farms.
- (4) Epworth, Adelaide and Glenwood farms.

(b) *Guard Areas.*

(1) The farms Haydon and Good Hope.

(2) The farms Warren, Lochinvar, the eastern sub-division of Willowvale, Makabusi Outspan, Ardbennie Township, Waterfall, Hopley, Saturday Retreat, Odar Outspan, Stoneridge, Spreckley, Eyrecourt, Eyerston, Retreat, Prospect, Bunker's Hill, Adair, Boutelle, Godavery, Twentydales, Deanesbrook, Nalire Native Reserve, Galway Estate, Mayfair, Sebastopol, Dispute, Caledonia, Donnybrook, Greengrove, Ventersburg, Lorelei, Letombo Reserve and Greendale.

## (3) NATIVE DISTRICT OF UMTALI.

(a) *Areas of Infection.*

(1) The farms Inodzi, Nyagari, Mountain Home (The B.), Umtali Mission and the Penhalonga Valley.

(2) The farm Mabonda.

(b) *Guard Area.*

The farms Walmer, Sheba, Epsom, Drennan, Banks, Coldstream, Savellein, Umtali Mission, Imbeza Valley, Duris, Fairholm, Ferndale, Barrydale and Forest Farm.

No. 239 of 1914.]

[4th June, 1914.]

## AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby, in terms of section 12 of Government Notice No. 50 of 1912, declare the following area of infection and guard area in the native district of Salisbury.

(a) *Area of Infection.*

The farm Bluff Hill.

(b) *Guard Area.*

The farms Crowborough, Parkridge, Fontainebleau, Reserve, Tynwald, Mabel Reign, Avondale, Gillingham, Rainham, Stamford, Homefield, Dove-dale, Stapleford, Glen Lussa, St. Marnocks, Kinvarra, Selby, Mount Hampden, Mount Hampden Reserve, Bendaugh, Glenara, Eskbank, Oldbury, Komani, Hinricksen, Thorn Park, Zizalisari Outspan, Mount Pleasant, Teviotdale, Vainona, Pomona.

## AFRICAN COAST FEVER.

*Transport Areas.*

Government Notice No. 387 dated 10th September, 1914, cancels all previous notices defining the areas within which the use of cattle for draught purposes is permitted and revises the same and in certain cases substitutes new areas. Farmers and others interested should obtain a copy of the notice in question, which appears in the *Government Gazette* dated 11th September, and contains full particulars of these new areas.

No. 449 of 1914.]

[22nd October, 1914.]

## AFRICAN COAST FEVER.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby, in terms of section 12 of Government Notice No. 50 of 1912, declare the farm Tynwald, in the native district of Salisbury, to be an area of infection.

No. 443 of 1914.]

[15th October, 1914.]

## ENZOOTIC ABORTION.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," and the "Animals Diseases Amending Ordinance, 1911," I do hereby declare the farm Gatzzi, in the native district of Marandellas, to be actively infected with the disease known as enzootic abortion, for the purposes of the said Ordinances.

No. 381 of 1914.]

[3rd September, 1914.]

## COMPULSORY DIPPING.

UNDER and by virtue of the powers vested in me by section 7 of the "Compulsory Dipping Ordinance, 1914," I hereby declare that the provisions of that Ordinance shall be applied in respect of cattle within the following areas from the date of issue of this Notice, dipping to take place at such intervals as the Chief Veterinary Surgeon shall direct.

The areas under the control of the Municipalities of Salisbury, Bulawayo, Gwelo and Umtali, the Sanitary Boards at Gatooma and Victoria, and the Village Management Boards at Que Que, Melsetter, Penhalonga, Marandellas, Hartley, Enkeldoorn, Avondale, Umvuma, Selukwe and Gwanda.

Further, I do hereby declare that a charge of one penny per head will be made in respect of all cattle dipped at Government dipping tanks, except unweaned calves, for which no charge will be made; and one penny in respect of all horses, mules and donkeys, and  $\frac{1}{2}$ d. in respect of all sheep.

No. 479 of 1914.]

[19th November, 1914.]

## DIPPING MATERIALS, DRESSINGS, ETC.

UNDER and by virtue of the powers vested in me by section 5, subsection 6 (e) of the "Animals Diseases Consolidation Ordinance, 1904," I do hereby provide that any expenditure incurred, under the direction of the Chief Inspector, in the supply of dipping materials, dressings, etc., for the treatment of animals infected or supposed to be infected with a destructive disease, shall be borne by and be recoverable from the owner of such animals.

No. 186 of 1914.]

[23rd April, 1914.]

## IMPORTATION OF CATTLE.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby cancel the regulations published under Government Notice No. 128 of 1914, and make the following provisions in lieu thereof :—

1. The importation of cattle will be permitted from the Cape Province, the Orange Free State and the Transvaal on the following terms and conditions :—

- (1) A permit shall be required from the Chief Inspector, which may contain such conditions as shall from time to time appear expedient.
- (2) The importation of cattle with more than two permanent central incisor teeth shall not be permitted, except that animals entered in the South African Stud Book or the appendix thereto, with not more than the first and second pairs of permanent incisors, may be imported.
- (3) Applications for permission to import shall be in the form "A" attached hereto, and accompanied by a declaration in the annexed form "B."



- (4) All importations shall be by rail, and for the purposes of importation, Bulawayo shall be the port of entry.
- (5) All cattle imported in terms of these regulations shall, on arrival at Bulawayo, Salisbury or Umtali, be submitted to such examination or tests as the Chief Inspector may direct. If such examination or tests disclose the existence of any destructive disease, the cattle shall be immediately destroyed and the carcasses thereof disposed of in such a manner as a Government Veterinary Surgeon may authorise or require. The Chief Inspector may permit of the age restriction and the tests aforesaid being dispensed with in the case of cattle in transit by rail to any place beyond the borders of Southern Rhodesia.
- (6) All expenses or losses incident to quarantine, examination, testing or destruction as aforesaid shall be borne by the owner of the cattle.

2. The importation of cattle from the United Kingdom of Great Britain and Ireland, the United States of America, the Kingdom of the Netherlands and Germany will be permitted under the following terms and conditions:—

- (1) Importation shall be through and direct from the ports of Cape Town or Port Elizabeth, and there shall be a consignment note or other satisfactory evidence that cattle so imported have come direct from one of the above-mentioned countries.
- (2) The provisions of sub-sections (1), (5) and (6) of section 1 hereof shall apply to importations in terms of this section.

3. Any person introducing cattle in contravention of these Regulations, or failing to comply with any of the conditions attached to permits to import, or furnishing applications, declarations, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, testing, destruction or disposal of carcasses, shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months, unless higher or greater penalties shall have been provided for such offences by the "Animals Diseases Consolidation Ordinance, 1904"; provided, however, that the penalties imposed by these Regulations shall not exempt any cattle from destruction in terms of the aforesaid Ordinance.

#### ANNEXURE "A."

##### APPLICATION FOR CATTLE IMPORTATION PERMIT.

1. Applicant's Name and Address.....
  2. Number and Class of Cattle to be imported.....
  3. Area or Farm and District where Cattle are at present located.....
  4. Area or Farm and District to which Cattle are to be moved.....
- Applicant's Signature.....
- Date.....
- Application.....
- Permit No.....

#### ANNEXURE "B."

I, ..... residing on the farm  
 ..... in the district of ..... do  
 solemnly and sincerely declare that the .....  
 (number in writing) animals also enumerated below have been in my pos-

session since birth, and that Lungsickness (Contagious Pleuro-Pneumonia) has not existed amongst any of my cattle, nor on my farm, during the last four years, and that these animals have never been exposed for sale in any public market or stock fair.

Number of Animals ..... Bulls ..... Heifers .....

Breed .....

Seller's Name and Address .....

Purchaser's Name .....

Place in Southern Rhodesia to which animals are being sent .....

And I make this solemn declaration conscientiously believing the same to be true. ....

Declared to at ..... on this ..... day of ..... before me, .....

Resident Magistrate for the District of .....

No. 211 of 1910.]

[4th August, 1910.]

#### IMPORTATION OF CATTLE FROM NORTH-WESTERN RHODESIA.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," I do hereby declare and make known that, notwithstanding the prohibition contained in Government Notice No. 89 of 1908, the importation of cattle from North-Western Rhodesia may be permitted under the following terms and conditions:—

1. The permission of the Chief Inspector of Cattle shall be first had and obtained.

2. All cattle shall be introduced (a) by rail via the Victoria Falls, or (b) by way of the town or port of Feira, which are hereby declared to be ports of entry.

3. All applications for permission to import shall be accompanied by a certificate by a Government Veterinary Surgeon of North-Western Rhodesia that—

(a) the districts from which they come and through which they pass are free from contagious diseases of animals;

(b) the animals in respect of which the application is being made have been examined and are free from contagious diseases of animals.

4. All cattle shall on entry be taken, where possible by rail, to such quarantine area and shall remain in quarantine for such period as the Chief Inspector of Cattle shall direct, but not less than three months.

5. Any person found introducing cattle in contravention of these regulations, or failing to comply with any of the conditions attached to permits to import, or furnishing applications, certificates, or other necessary documents known to be false in any material particular, or failing to comply with all lawful directions as to quarantine, examination, etc., shall be liable to a fine not exceeding £20 for each animal in respect of which such offence shall have been committed, and in default of payment to imprisonment with or without hard labour for any period not exceeding six months; provided, however, that the penalties imposed by these regulations shall not exempt from liability to penalties, forfeiture, or destruction, elsewhere provided for

## ANNEXURE "A."

*Certificates under Section 3.*

(a) I hereby certify that I have examined the following cattle belonging to Mr. ....

.....cows and heifers,

.....calves,

.....oxen and bulls,

and that the districts from which they come and through which they will pass in this Territory *en route* to Southern Rhodesia are to the best of my knowledge free from all destructive diseases of cattle.

Signed.....

Government Veterinary Surgeon.

(b) I hereby certify that I have examined the following animals belonging to Mr. ....

.....cows and heifers,

.....calves,

.....oxen and bulls.

In my opinion these animals are free from all destructive diseases.

Signed.....

Government Veterinary Surgeon.

NOTE.—All numbers are to be expressed in words.

### IMPORTATION OF STOCK FROM THE PROVINCE OF THE CAPE OF GOOD HOPE.

WITH reference to Departmental Notice of 28th February, 1912, it is hereby notified that the said Notice is cancelled, and importation of stock will now be permitted, in terms of Government Notice No. 110 of 1908, from the Province of the Cape of Good Hope, with the exception of the following districts :—

Komgha  
East London

Peddie  
Victoria East  
Kingwilliamstown  
Stutterheim  
Cathcart

Stockenstrom  
Queenstown (Gwatyu Ward  
only)  
Glen Grey  
Maclear  
Elliot Slang River  
Wodehouse  
Barkly East

No. 364 of 1914.]

[27th August, 1914.

### REGULATIONS GOVERNING IMPORTATION OF LIVE STOCK, ETC.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," as amended from time to time, I do hereby cancel the regulations published under Government Notices Nos. 295 and 394 of 1908; 38, 61 and 263 of 1909; and 60 of 1911 and 188 of 1912, 47 of 1913, and so much of any other regulations as may be repugnant to or inconsistent with the subjoined regulations, which are hereby declared to be of full force and effect.

1. The importation of the following animals from the respective countries or districts enumerated is prohibited, owing to the existence or supposed existence of destructive diseases affecting the said animals in the said countries :—



(1) All animals and dogs as defined by the aforesaid Ordinance from—

India,  
Mauritius,  
Persia,  
British Burmah,  
Assam,  
China and bordering countries, including Korea,  
French Indo-China,  
Dutch East Indies,  
Hong-Kong,  
Federal Malay States,  
The Philippines,  
Zanzibar,

and all other countries where surra is known or suspected to exist.

(2) Pigs from the Union of South Africa, the Bechuanaland Protectorate, the Tati Concession, and other countries in which swine fever exists or is suspected to exist, subject, however, to the exceptions contained in the proviso to this section.

(3) Dogs from the territories of Northern Rhodesia and Portuguese East Africa, subject, however, to the exceptions in the proviso of this section.

(4) Sheep and goats from the districts of Albany, Alexandria, Bathurst, Bedford, East London, Fort Beaufort, Humansdorp, Jansenville, Kingwilliamstown, Komgha, Peddie, Somerset East, Stockenstroom, Uitenhage and Victoria East, in the Cape Province; the districts of Barberton, Lydenburg, Marico, Pretoria, Rustenburg, Waterberg and Zoutpansberg, in the Transvaal; Swaziland, Portuguese East Africa, Northern Rhodesia.

Provided, however—

- (a) that the Chief Inspector may at his discretion permit the importation of pigs, sheep and goats from the above-mentioned places on production of a certificate signed by a duly authorised Government Veterinary Officer in the form of Schedule "A" attached hereto;
- (b) that the importation of dogs required for scientific purposes only may be permitted from the places mentioned in sub-section (3) hereof, by the Chief Inspector, in writing, subject to such conditions as may be imposed by him;
- (c) that dogs, sheep, goats and pigs from countries from which importation is permitted may be introduced *via* the port of Beira, provided that all such animals shall be transferred directly after disembarkation to the railway trucks at Beira, and conveyed thence to Umtali without leaving the said trucks.

2. The areas set out in Schedule "B" hereto are hereby appointed for the depasturing and quarantining of animals for slaughter in connection with the places therein mentioned.

3. The several districts of Southern Rhodesia are hereby declared to be an area infected with scab amongst sheep and goats, and the movement of all sheep and goats from any farm to beyond the limits thereof, or from their usual grazing ground within the limits of any town lands or native reserves to any other place, is prohibited, except under the written permit of an Inspector or Sub-Inspector. Such permit shall set forth the number and description of animals to be moved, the route they shall travel, and the period for which the permit shall be in force. In cases where it may be necessary or desirable, the person to whom such permit is issued may be required to cause the animals referred to therein to be dipped before being moved.

4. The introduction of sheep and goats is prohibited except—

- (a) as specially provided for by section 1 hereof;
- (b) from places not mentioned in section 1, if accompanied by a certificate in the form set out in Schedule "C" hereof.

5. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by rail shall immediately report such arrival to the Veterinary Office at Salisbury, Bulawayo and Umtali respectively, and no such animal shall be detained at any intermediate station without the written authority of a Government Veterinary Surgeon.

6. The owner or person in charge of any horse, mule or donkey entering Southern Rhodesia by road shall immediately report such arrival at the Police Camp nearest to the place where such entry is made, and the officer in charge of such Police Camp shall immediately report to the Veterinary Department, which shall direct what steps are to be taken to test such animals with mallein, as in the following clause provided.

7. All horses, mules and donkeys, upon entering Southern Rhodesia, shall be tested with mallein, and the owner or person in charge of such animals shall in all respects carry out the lawful directions of the Inspector while such animals are being tested; provided that this regulation shall not apply to animals in transit through Southern Rhodesia which are not detained *en route*.

8. Horses, mules and donkeys lawfully in this Territory, and required for purposes necessitating frequent crossing of the border, may be allowed to so cross on such terms as to registration, branding, testing and conditions as the Chief Veterinary Surgeon may from time to time deem expedient to prescribe.

9. An Inspector may direct the thorough cleansing and disinfecting of trucks which may be reasonably suspected of being sources of infection of any destructive disease, and may direct the destruction of truck fittings, fodder, excreta, or other matter or thing which may be reasonably calculated to convey such infection.

10. Any persons contravening the provisions of these regulations, or the instructions or directions given in terms of these regulations, shall be liable in respect of each offence to a penalty not exceeding twenty pounds, or in default of payment to imprisonment with or without hard labour for a period not exceeding three months, unless where more or heavier penalties have by the aforesaid Ordinance, or by other regulations framed thereunder, been expressly provided.

#### SCHEDULE "A."

##### *Certificate.*

Issued under provisions of section 1, Government Notice No. 364 of 1914.

This is to certify that the animals enumerated below are, in my opinion, free from any destructive disease, including heartwater; and, to the best of my knowledge and belief, have not been in contact with any infected animals, nor come from, or through, a locality where any such disease is known to exist or has existed for twelve months from date hereof.

Date....., 19...

Place .....

.....  
Signature of

Government Veterinary Surgeon.

Number and general description of animals:

.....Pigs, .....Sheep, .....Goats.

Place from which animals are to be sent:

Owner's name and address:

Place in Southern Rhodesia to which it is desired to send the animals

## SCHEDULE "B."

Description of areas set apart for depasturing and quarantining of animals  
for slaughter.

*Salisbury.*—A fenced piece of land, 400 acres in extent, situated on the Makabusi River below Maggio's plot, within the Salisbury commonage and towards the southern boundary thereof.

*Bulawayo.*—That piece of fenced land situated on the Bulawayo commonage between the railway line, to the south, and the Solusi road, adjoining and to the south-west of the Government dipping tank, in extent 1,000 acres more or less.

*Gwelo.*—Starting from a point where the Ingwania road crosses the railway, along this road past the sanitary stables to a point a quarter of a mile west, thence in a line parallel with the railway to the Gwelo River, thence along the river to the commonage beacon No. 11, thence in a straight line to the Shamrock road where it is intersected by the Scout's Spruit, thence along the Shamrock road to where it joins the Main Street extension, thence along this to the railway line, and down this to the starting point.

*Umtali.*—A piece of fenced land situated on the old Darlington Farm section of the Umtali commonage.

*Penhalonga.*—A piece of fenced land situated on plot No. 2, Imbeza plots.

*Selukwe.*—A piece of fenced land, in extent about 300 acres, situated on the farm Sebanga and adjacent to the township of Selukwe.

## SCHEDULE "C."

I, ..... residing at .....  
in the district of... ..... in the.....  
Colony, do solemnly and sincerely declare that the animals enumerated  
below are free from any contagious disease, including scab, and have not  
been in contact with any infected animals within six months from date  
hereof, and that, to the best of my knowledge and belief, such animals, in  
travelling to.....† station, will not come in contact with  
any animals amongst which scab or any other contagious disease exists.

And I make this solemn declaration conscientiously believing the same  
to be true.

Declared to at.....on this.....  
day of.....before me.

.....  
Magistrate, Government Veterinary  
Surgeon, Scab Inspector, or Police  
Officer of district from which animals  
are being sent.

Number and general description of animals being sent.....  
Owner's name and address.....

Place in Southern Rhodesia to which animals are being sent.....  
† Station within Colony of origin.

No. 442 of 1914.]

[15th October, 1914.

## ISSUE OF PERMITS FOR THE REMOVAL OF STOCK.

IT is hereby notified for public information that His Honour the  
Administrator has approved of members of the British South Africa Police



issuing permits for the removal of cattle, sheep and goats at the under-mentioned stations when no Inspector or Sub-Inspector of Cattle is available :—

Nyamandhlovu.  
Gwanda.  
Plumtree.  
Fort Rixon.  
Belingwe.  
Inyati.  
Fort Usher.

Mphoeng's.  
Holi.  
Filabusi.  
Gwaai.  
Figtree.  
Umvuma.  
Que Que.

No. 375 of 1912.]

[28th November, 1912.

#### IMPORTATION OF POULTRY.

UNDER and by virtue of the powers vested in me by the "Animals Diseases Consolidation Ordinance, 1904," as amended by the "Animals Diseases Amendment Ordinance, 1910," I do hereby declare and make known that the following regulations shall be in force and effect from date of publication hereof :—

(1) All poultry imported by rail shall be inspected by an Inspector or Sub-Inspector at Plumtree, Bulawayo or Umtali.

(2) Should any consignment of poultry shew symptoms of disease, or should such Inspector or Sub-Inspector have reason to believe that any disease exists in, or that infection is likely to be conveyed by such consignment, he may order the detention and isolation of the whole consignment for such period as he may deem necessary.

(3) The Chief Inspector may order the destruction of all poultry which he has reasonable grounds for believing to be diseased or likely to convey infection.

THE following extract from Live Stock Regulations, printed on page 150 of the South African Railways Official Tariff Book, is published for general guidance :—

Poultry are not accepted by rail unless they are placed in a crate and the following conditions are complied with :—

(1) The size of the crate shall be 3 feet 6 inches by 2 feet 9 inches external floor dimensions; for turkeys and geese the height shall be 30 inches; and for fowls, ducks, and poultry of a like size, the height shall be 20 inches.

(2) Each crate must contain two drinking vessels filled with pure water, such vessels to be not less than five inches in depth, of the unspillable type, one being fixed at opposite corners of the coop.

(3) Each crate shall contain two receptacles for food of a suitable size, filled with suitable food other than whole maize.

(4) The birds must not be over-crowded in the crates, and in no case must there be more than 20 fowls, ducks or other birds of a like size, or ten turkeys or geese.

(5) Different species of birds must not be placed in the same coop.

Unless coops, crates, and the like are strong enough to bear ordinary transit handling, the Administration will not accept responsibility for loss.

No. 382 of 1914.]

[3rd September, 1914.

### IMPORTATION OF PLANTS, ETC.; REGULATIONS : EXAMINATION FEES.

UNDER and by virtue of the powers vested in me by the "Importation of Plants Regulation Ordinance, 1904," I do hereby cancel sub-section (4) of section 3 of the regulations published under Government Notice No. 259 of 1913, and make the following provisions in lieu thereof :—

- "(4) An examination fee of three pence for every ten packages or cases or, any less number in a consignment with a minimum fee of one shilling per consignment will be charged, regardless of number of classes of plant present. In the case of plants calling for treatment a fee of five shillings for each use of the fumigating chamber will be levied."

### SUMMARY OF THE GAME LAWS.

Game is divided into three distinct classes, described as follows :—

- (a) Birds and Small Buck.
- (b) Bushbuck, Hartebeest, Impala, Lechwe, Pookoo, Roan and Sable Antelope, Sitatunga, Tsessebe, Waterbuck, and Wildebeest.
- (c) Royal Game, which includes Eland, Elephant, Giraffe, Gemsbok, Hippopotamus, Inyala, Koodoo, Ostrich, Rhinoceros, Springbuck and Zebra.

The shooting season for Class "A" is as follows :—

In Mashonaland :

Birds from 1st May to 30th September.

Small Buck from 1st May to 31st October.

In Matabeleland :

Birds and Small Buck from 1st May to 31st October.

To shoot in Class "A" a licence costing £1 per annum is required. This entitles holders to hunt in both Provinces during the open season.

Class "B."—The season opens on 1st July and closes on 30th November in both Provinces. The licence fee is £25 for non-residents and £5 for persons having their domicile in Southern Rhodesia. This licence entitles the holder to shoot up to 15 head, which number may be increased to a total of 25 upon payment of a further sum of £15 in the one case and £5 in the other.

Class "C."—The Administrator may, if he is satisfied that the animals are actually required for scientific purposes, grant to the holder of a game licence permission to shoot or capture any of the species included in this Class. Such permit requires a £5 stamp. Applications in writing, together with proof of *bona-fides*, should be addressed to the Director of Agriculture.

Game for Farming Purposes.—Permits may be granted for the capture of Eland, Ostrich, Zebra or other animals for the purposes of breeding or farming. Such permits require a stamp of the value of £1 and remain in force for six months. Application, accompanied by a sworn declaration, should be made through the Director of Agriculture or the Civil Commissioner of the district.

Game Injuring Crops.—The occupier of any cultivated land or any person acting under the authority of such occupier, may at any time destroy game actually doing damage on such land.

Elephants on Occupied Farms, Melsetter.—The destruction of Elephants when found on occupied farms on the High Veld in Melsetter District is authorised (*vide* Government Notice No. 284 of 1908).



*Open areas.*

The shooting or capturing of all classes of game with the exception of ostriches and other birds classified as game is permitted within the following areas in the Hartley district and the Sebungwe district until further notice.

**Hartley District.**—From the railway bridge on the Umfuli River, thence north-westwards along the Umfuli River to where it joins the Umniati River, thence southwards along the Umniati River to where it joins the Umsweswe River, thence eastwards along the Umsweswe River up to the drift at the Lydia Mine, thence along the old road from Lydia Mine to Etna Mine and to Inez Mine, thence northwards along the road from Inez Mine to Hartley, thence in the direction of the railway bridge to the starting point on the Umfuli River.

**Sebungwe District.**—From the confluence of the Sengwe and Lutope Rivers up the Lutope to its headwaters, thence in a south-east and easterly direction following the southern edge of the escarpment, leaving Meare's farm to the south, to the Mafungabusi Peak, thence northwards along the escarpment to the Njelele River, and down that river to its confluence with the Sanyati River, thence northwards down the Sanyati River to its confluence with the Piriwiri River, thence direct in a north-westerly direction to Picaninyemba, and thence along the footpath to Nenyunka on the Sengwe River, thence southerly up the Sengwe River to its confluence with the Lutope.

**Elephants, Hartley District.**—Notice No. 168 of 1914 permits the shooting or capturing of elephants on or within five miles of the farm Walden, in the Hartley District, for a period of one year from 9th April, 1914.

The game specified may be shot in these open areas without a licence.

Game in Class "A" may be hunted in the close season until further notice on private land in the Melsetter district by holders of a licence.

**Protected Areas.**—No game may be hunted or killed within the limits of the Commonage or Townlands of Bulawayo and within a radius of two miles of the Court House, Gwelo, or within the Urungwe Game Sanctuary, as defined by Government Notice No. 237 of 1906.

"Locust Birds" are strictly protected, *vide* Government Notice No. 390 of 1912.

**Export of Game.**—No living Game or the Eggs of any Game Birds may be exported beyond the limits of Southern Rhodesia without a written permit.

**Shooting on Private Land.**—A licence does not entitle the holder thereof to shoot on private land without the permission of the land-owner.

**Farmers Shooting Game on their Farms.**—By taking out a special £1 licence, farmers may at any time shoot any game on their land. "Game" does not include any birds, except ostriches.

No. 390 of 1912.]

[19th December, 1912.]

### PROTECTION OF LOCUST BIRDS.

UNDER and by virtue of the powers vested in me by the "Game Law Consolidation Ordinance, 1906," I do hereby declare that the following Locust Birds:—

- (1) Great Locust Bird or White Stork (*Ciconia alba*);
- (2) Lesser Locust Bird or Nordmann's Pratincole (*Glareola melanoptera*);
- (3) Small White Heron or Cattle Egret (*Bubulcus ibis*);
- (4) Wattled Starling (*Dilophus carunculatus*);

are added to class "A" of the said Ordinance, and shall be strictly protected, and not hunted or destroyed, throughout Southern Rhodesia for a period of five years from date hereof.



No. 249 of 1908.]

[27th August, 1908.

## PROTECTION OF TREES.

IT is hereby notified for public information that any person who shall cut down for use as fuel, or for any other purposes than *bona-fide* farming, mining or manufacturing purposes, or cause to be so cut down the "Wild Westeria" (native name M'Pakwa or M'poea) tree, will be liable to prosecution for contravention of the provisions of the Forest and Herbage Preservation Act, 1859, and upon conviction to a fine not exceeding £100, or to imprisonment with or without hard labour for a term not exceeding six months, or to such fine and imprisonment, or to such imprisonment without a fine.

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No. 412 of 1914.]

[24th September, 1914.

## POUND AT PLUMTREE.

UNDER and by virtue of the powers vested in me by section 5 of "The Pounds and Trespasses Ordinance, 1903," I do hereby declare and make known that at the request of the Acting Civil Commissioner, Bulawayo, the pound on the farm Luscombe established by Government Notice No. 70 of 1910 is hereby abolished as from the 1st October, 1914, and that a pound has been established on the plot Rangiora, Plumtree, and that the said pound shall be available for the public as from that date.

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No. 448 of 1914.]

[22nd October, 1914.

## POUND AT MATOPO VALE.

UNDER and by virtue of the powers vested in me by section 5 of "The Pounds and Trespasses Ordinance, 1903," I do hereby declare and make known that at the request of the Civil Commissioner, Bulawayo, the pound on farm Cardross Park, established by Government Notice No. 111 of 1912, is hereby abolished as from the date of this notice, and that a pound has been established at Matopo Vale near Fort Usher, in the district of Bulawayo, and that the said pound shall be available for the public as from that date.

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No. 480 of 1914.]

[19th November, 1914.

## ESTABLISHMENT OF POUNDS ALONG THE RAMAQUABANE RIVER.

UNDER and by virtue of the powers vested in me by section 5 of "The Pounds and Trespasses Ordinance, 1903," I do hereby declare and make known that at the request of the Civil Commissioner, Bulawayo, pounds have been established at the gates in the border fence at (1) Mpinis, (2) Madabis, (3) Raditladis and (4) Mphoengs, in the magisterial district of Bulawayo, and that the said pounds shall be available for the public as from the 1st November, 1914.

## Department of Posts and Telegraphs, Southern Rhodesia.

Postal Notice No. 12 of 1913.

### AGRICULTURAL PARCELS POST.

IT is hereby notified for public information that, on and after the 1st August, 1909, any article produced, and, if manufactured, produced and manufactured within Southern Rhodesia may be transmitted by Agricultural Parcels Post at the reduced rate of threepence per lb. or fraction thereof, up to a limit of eleven lbs. in weight.

The Agricultural Parcels Post is designed to bring the producer into direct communication with the consumer, and is available for the transmission of :—

|                        |             |              |
|------------------------|-------------|--------------|
| Biscuits               | Dried Meats | Plants       |
| Bread                  | Eggs        | Poultry      |
| Butter                 | Flour       | Seeds        |
| Confectionery          | Flowers     | Sugar        |
| Cigarettes             | Honey       | Tobacco      |
| Dried & Bottled Fruits | Jam         | Wool Samples |

and other articles produced within Southern Rhodesia. It does not extend beyond the borders of Southern Rhodesia.

The senders of articles at the reduced tariff applicable to the Agricultural Parcels Post will be required to sign a declaration that the contents are the *bona fide* produce of Southern Rhodesia.

The limits of size and weight, and the general regulations, are those applicable to the Inland Parcels Post.

G. H. EYRE,  
Postmaster General.

General Post Office, Salisbury,  
31st March, 1913.

### MAIZE FOR EXPORT OVERSEA VIA BEIRA BY PRIVATE AGENCY.

THE Beira and Mashonaland and Rhodesia Railways announce that with reference to the export rate for maize (minimum 15 tons), quoted in section (g), page 100 of Goods Tariff Book No. 7, it is hereby notified that, with effect from 1st November, a maximum rate of 12s. 6d. a ton (including pierage at Beira) for maize exported through Private Agency will apply from all stations Gatooma to Beira, including the Lomagundi and Mazoe Branch Lines.

### REDUCTION IN RATE FOR POTATOES AND ONIONS.

THE Beira and Mashonaland and Rhodesia Railways announce that, with effect from the 1st December, 1914, potatoes and onions (South African and imported) will be carried over these lines at the scale rate applicable to meal, shewn on page 101 of Goods Tariff Book No. 7.

This reduction in rate does not apply to seed potatoes.

### SPECIAL RATE FOR WHEAT AND OATS (LOCALLY GROWN).

THE Beira and Mashonaland and Rhodesia Railways announce that, with effect from the 1st December, 1914, the following special rates will apply :—

Umtali—Salisbury ... .. 21s. 9d. per ton.  
Any Station, Victoria to Umtali (inclusive)—Salisbury ... 26s. 2d. per ton.

Full truck loads, owner's risk. All handling by owners.

ADVERTISEMENTS.

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**British South Africa Company.**

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**GOVERNMENT FARM, GWEBI**

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**AT STUD**

**FRIESLAND BULL.**

***Dutchland Colantha Sir Cornucopia.***

No. 92,533 A.H.F.H.B.

This bull was recently purchased from Mr. A. J. Maclaurin, by whom he was imported from the United States of America. He comes of a family of very noted milking powers. The record average production over seven days of his dam and grand-dam was 30-40 lbs. of butter.

**Fee £2 2s.**

**SHORTHORN BULL.**

***Favourite Pride.***

A pedigree red shorthorn bull, bred by Mr. James Durno, Rothiebrisanne, Fyvie, Scotland, and imported in 1911, and entered in the Coates Shorthorn and South African Stud Books.

**Fee £2 2s.**

**LARGE BLACK BOAR.**

***Honingberg Bridgman II.***

No. 195, S.A. Stud Book, vol. vi.

Bred by Mr. S. C. Skaife, Bloemfontein.

**Fee 5s.**

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**ALL FEES ARE STRICTLY PAYABLE IN ADVANCE.**

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Full particulars regarding above may be obtained on application to the  
DIRECTOR OF AGRICULTURE, Salisbury.



# Rhodesia Agricultural Journal.

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## INDEX, VOL. XI., 1913-1914.

|  | NO. | PAGE |
|--|-----|------|
| African Coast Fever ... ..                                   | 7   | 973  |
| Agricultural Co-operation ... ..                             | 1   | 8    |
|  | 1   | 25   |
|  | 6   | 828  |
| Agricultural Department Staff ... ..                         | 8   | 1113 |
| Agricultural Implements in Rhodesia ... ..                   | 3   | 349  |
| Agricultural Outlook ... ..                                  | 1   | 125  |
|  | 2   | 276  |
|  | 4   | 609  |
|  | 5   | 768  |
|  | 6   | 923  |
|  | 7   | 1059 |
|  | 8   | 1195 |
| Agricultural Shows ... ..                                    | 4   | 513  |
|  | 6   | 813  |
|  | 7   | 977  |
| Agricultural Statistics ... ..                               | 3   | 345  |
|  | 4   | 505  |
|  | 5   | 710  |
|  | 7   | 973  |
|  | 7   | 980  |
| Agricultural Union ... ..                                    | 4   | 503  |
| Analysis of Agricultural Products, Soils, Water, etc. ... .. | 1   | 123  |
| Appointment of Citrus Expert ... ..                          | 7   | 975  |
| Arsenical Dipping Fluids—Oxidation of ... ..                 | 4   | 579  |
| Assistant Agricultural Engineer ... ..                       | 7   | 976  |
|  |     |      |
| Bacon Factory ... ..   | 1   | 5    |
|  | 3   | 341  |
|  | 7   | 972  |
|  | 8   | 1175 |
| Bee-Keeping ... ..   | 1   | 98   |
|  | 2   | 246  |
|  | 5   | 760  |

|  | NO. | PAGE |
|--|-----|------|
| Boring for Water ... ..  | 2   | 192  |
| Breeding and Feeding of Pigs for Bacon Factory Purposes ...                  | 3   | 358  |
| Brickmaking—Hints on ... ..  | 1   | 72   |
| Bright Virginian Tobacco Soils ... ..  | 2   | 209  |
| Buckwheat ... ..   | 5   | 739  |
| Bulawayo Show Awards ... ..  | 7   | 977  |
|  |     |      |
| Cabbage Webworm ... ..   | 3   | 416  |
| Calendar of Crop Sowings ... ..  | 7   | 1038 |
| Cape Wines ... ..  | 8   | 1120 |
| Castor Oil Beans ... ..  | 4   | 529  |
| Cattle Breeding—Notes on ... ..  | 1   | 83   |
| Cattle, Dairy—Principle of Winter Feeding ... ..                             | 7   | 1017 |
| Cattle, Imported—Feeding and Care of ... ..                                  | 2   | 220  |
| Cattle—Importation of ... ..   | 4   | 504  |
| Cattle—Insurance of ... ..   | 4   | 507  |
| Cattle—Movement of from Drought Areas ... ..                                 | 6   | 922  |
| Cattle Owned by Natives ... ..   | 5   | 663  |
| Cattle—Testing and Inoculation of in Great Britain prior to<br>Export ... .. | 8   | 1183 |
| Chafer Beetles ... ..  | 8   | 1144 |
| Champion Bull of Rhodesia—Thousand Guinea Trophy ... ..                      | 1   | 115  |
| Charcoal ... ..  | 3   | 348  |
| Chief Veterinary Surgeon ... ..  | 6   | 828  |
| Citrus Fruits in Rhodesia—Where to Plant ... ..                              | 2   | 224  |
| Citrus Fruits—Exportation to London ... ..                                   | 2   | 231  |
| Citrus Fruit—Rhodesia Late Valencia on London Market ...                     | 3   | 414  |
| Citrus Fruits—Cultivation and Pruning ... ..                                 | 4   | 534  |
| Citrus Growing Experiences in Rhodesia ... ..                                | 5   | 703  |
| Citrus Fruits—Preparation of Oranges for Market ... ..                       | 6   | 843  |
| Citrus Expert—Appointment of ... ..  | 7   | 975  |
| Citrus Fruits in Rhodesia ... ..   | 8   | 1141 |
| Closer Settlement in Matabeleland ... ..                                     | 1   | 47   |
| Collection of Agricultural Statistics in Rhodesia ... ..                     | 7   | 980  |
| Comparative Schedule of Rainfall ... ..                                      | 6   | 934  |
| Compulsory Dipping ... ..  | 2   | 190  |
|  | 6   | 854  |
| Concrete and Reinforced Concrete ... ..                                      | 6   | 857  |
| Concrete—Preparation and Use of ... ..                                       | 4   | 582  |
| Construction of Dipping Tanks for Cattle ... ..                              | 2   | 196  |
| Contributions ... ..   | 1   | 12   |
| Co-operation—Agricultural ... ..   | 1   | 8    |
| Co-operation—Notes on ... ..   | 1   | 25   |
| Co-operation ... ..  | 2   | 195  |
| Co-operative Dairies—Umtali ... ..   | 4   | 597  |

|   | NO. | PAGE |
|---|-----|------|
| Correspondence—Bee Keeping ... ..                           | 1   | 126  |
| —Live Stock Insurance ... ..                                | 2   | 267  |
| —Brickmaking ... ..   | 3   | 446  |
| —Kraaling of Cattle ... ..                                  | 2   | 268  |
| —Ploughing New Land ... ..                                  | 3   | 445  |
| —Citrus Trees at Premier Estate ... ..                      | 4   | 604  |
| Cream—Its Separation, Handling and Sale to Butter Factories | 4   | 605  |
| Crop Returns at Botanical Experiment Station ... ..         | 4   | 606  |
| Crops—New for Rhodesia ... ..                               | 5   | 766  |
| Cultivation of Castor Oil Beans ... ..                      | 5   | 752  |
|   | 7   | 1043 |
|   | 2   | 217  |
|   | 6   | 902  |
|   | 4   | 529  |
| Dates of Meetings of Farmers' Associations ... ..           | 1   | 139  |
|   | 2   | 287  |
|   | 3   | 469  |
|   | 4   | 627  |
|   | 5   | 785  |
|   | 6   | 941  |
|   | 7   | 1075 |
|   | 8   | 1211 |
| Departmental Notices ... ..                                 | 1   | 140  |
|   | 2   | 288  |
|   | 3   | 470  |
|   | 4   | 628  |
|   | 5   | 785  |
|   | 6   | 942  |
|   | 7   | 1078 |
|   | 8   | 1212 |
| Dhal or Pigeon Pea ... ..                                   | 8   | 1137 |
| Dipping Tanks ... ..  | 2   | 189  |
| Dipping Tanks—Construction of ... ..                        | 2   | 196  |
| Dipping Tank—Reinforced Concrete ... ..                     | 6   | 857  |
| Diseases of Potato Tuber and Selection of Sound Seed ... .. | 3   | 399  |
| Distomatosis or Liver Fluke in Cattle and Sheep ... ..      | 8   | 1170 |
| Drought—Lessons of ... ..                                   | 1   | 33   |
| Dusty Surface Beetle ... ..                                 | 6   | 894  |
| Early Gluyas Wheat ... ..                                   | 8   | 1181 |



|   | NO. | PAGE |
|---|-----|------|
| Employment on Farms ... ..  | 1   | 156  |
|   | 2   | 302  |
|   | 3   | 485  |
|   | 4   | 641  |
|   | 5   | 797  |
|   | 6   | 954  |
|   | 7   | 1093 |
|   | 8   | 1224 |
| Encouragement of a Pure Seed Supply ... ..                                      | 3   | 342  |
| Eucalypts for the Farm ... ..   | 8   | 1157 |
| Excursions of Instruction ... ..  | 1   | 2    |
| Experiments—Irrigation ... ..   | 7   | 979  |
| Experiments—Lochard ... ..  | 8   | 1161 |
| Experiments—Maize at Gwebi ... ..   | 8   | 1152 |
| Experiments—Rhodes Trust ... ..   | 6   | 827  |
| Export of Hides and Skins ... ..  | 3   | 448  |
| Export of Maize ... ..  | 8   | 1125 |
| Extracts from Report of Agriculturist and Botanist, 1912 ... ..                 | 1   | 14   |
| Extracts from Report of Director of Agriculture, 1913 ... ..                    | 5   | 670  |
| Extracts from Report of Chief Veterinary Surgeon, 1913 ... ..                   | 6   | 830  |
| Extracts from Report of Government Veterinary Bacteriologist,<br>1913 ... ..    | 6   | 839  |
| Extracts from Report of Government Agriculturist and Botan-<br>ist, 1913 ... .. | 7   | 1053 |
| Extracts from Report of Agricultural Chemist, 1913 ... ..                       | 7   | 1056 |
| Farmers' Tour ... ..  | 5   | 660  |
|   | 8   | 1113 |
| Farmers' Tour—Tobacco Address ... ..  | 8   | 1129 |
| Farms and Farming in Rhodesia—Nyamandhlovu and Bubi ... ..                      | 4   | 542  |
| Fat Stock Show at Salisbury ... ..  | 2   | 195  |
| Feeding and Care of Imported Cattle ... ..                                      | 2   | 220  |
| Fertilisers, Farm Foods, Seeds and Pest Remedies Ordinance ... ..               | 5   | 745  |
|   | 8   | 1116 |
| Fertilisers—Purchase of ... ..  | 1   | 64   |
| Fertilisers—Reduction in Rate on ... ..   | 5   | 669  |
| Fluke in Cattle and Sheep ... ..  | 8   | 1170 |
| Forestry ... ..   | 6   | 828  |
| Garden Calendar ... ..  | 1   | 136  |
|   | 2   | 277  |
|   | 3   | 458  |
|   | 4   | 615  |

|   | NO. | PAGE |
|---|-----|------|
| Garden Calendar (continued)—                                  |     |      |
|   | 5   | 774  |
|   | 6   | 928  |
|   | 7   | 1065 |
|   | 8   | 1200 |
| Government Notices .....                                      | 1   | 158  |
|   | 2   | 304  |
|   | 3   | 487  |
|   | 4   | 643  |
|   | 5   | 799  |
|   | 6   | 956  |
|   | 7   | 1095 |
|   | 8   | 1225 |
| Grading of Maize .....  | 4   | 506  |
| Ground Nut .....  | 6   | 867  |
| Guada Bean .....  | 4   | 510  |
| Gwelo Creamery—Hints and Suggestions to Farmers .....         | 1   | 90   |
| <br>  |     |      |
| Hides and Skins—Export of .....                               | 3   | 448  |
| Hides and Skins—How to Cure .....                             | 5   | 728  |
| Hides—Rhodesian .....   | 5   | 665  |
| Hints for Tobacco Growers .....                               | 7   | 1034 |
| Hints on Brickmaking .....                                    | 1   | 72   |
| Hints on Irrigation—Pumping Plants .....                      | 1   | 52   |
| Hop Cultivation .....   | 4   | 510  |
| Hop Growing—Notes on .....                                    | 4   | 556  |
| Horse—Treatment of Biliary Fever with Trypan Blue .....       | 5   | 735  |
| How to Cure Hides and Skins .....                             | 5   | 728  |
| <br>  |     |      |
| Illustrations of Natural Forest in Relation to Tsetse Fly ... | 4   | 568  |
| Immunisation of Imported Cattle against Northern Rhodesia     |     |      |
| Piroplasmosis and Anaplasmosis .....                          | 1   | 95   |
| Importation of Cattle .....                                   | 4   | 504  |
| Importation of Live Stock from Germany .....                  | 5   | 668  |
| Importation of Stock .....                                    | 7   | 975  |
| Importation of Stock from England .....                       | 1   | 9    |
| Imports .....   | 4   | 511  |
| Insurance of Cattle .....                                     | 4   | 507  |
| International Beef Trade .....                                | 1   | 102  |
| Irrigation Experiments .....                                  | 7   | 979  |
| Irrigation—Hints on, Pumping Plants .....                     | 1   | 52   |

|  | NO. | PAGE |
|--|-----|------|
| Land Scheme ... ..                                     | 2   | 191  |
| Lane's Produce Market ... ..                           | 5   | 778  |
|  | 6   | 933  |
| Lectures at Meetings of Farmers' Associations ... ..   | 1   | 9    |
| Lectures on Agriculture ... ..                         | 1   | 1    |
| Legislative Council ... ..                             | 5   | 659  |
| Lessons of Drought ... ..                              | 1   | 33   |
| Live Stock—Railway Rates ... ..                        | 8   | 1121 |
| Live Stock in Germany ... ..                           | 5   | 737  |
| Locally Grown Wheat and Oats ... ..                    | 8   | 1119 |
| Lucerne ... ..   | 4   | 566  |
| Maize Contribution to Imperial Government ... ..       | 8   | 1121 |
| Maize Experiments—Gwebi ... ..                         | 8   | 1152 |
| Maize—Export Rates ... ..                              | 1   | 9    |
| Maize—Export of ... ..                                 | 8   | 1125 |
| Maize—Grading of ... ..                                | 4   | 506  |
| Maize—Moisture in ... ..                               | 3   | 396  |
| Maize—Production of Pedigree Seed ... ..               | 3   | 408  |
| Maize Reaper and Binder ... ..                         | 5   | 664  |
|  | 8   | 1119 |
| Maize—Rhodesian, Principal Types ... ..                | 1   | 41   |
| Manurial Experiments with Maize ... ..                 | 6   | 829  |
| Manuring of Maize at Government Experiment Farm ... .. | 6   | 885  |
| Marandellas Agricultural Show ... ..                   | 7   | 977  |
| Market Reports .. ..                                   | 1   | 134  |
|  | 2   | 278  |
|  | 3   | 460  |
|  | 4   | 617  |
|  | 5   | 776  |
|  | 6   | 930  |
|  | 7   | 1067 |
|  | 8   | 1202 |
| Merino Wool Sales ... ..                               | 5   | 666  |
| Moisture in Maize ... ..                               | 3   | 396  |
| Molasses for Stock ... ..                              | 3   | 347  |
|  | 6   | 826  |
| Monkey Nuts ... ..                                     | 6   | 857  |
| Monthly Journal ... ..                                 | 7   | 972  |
|  | 8   | 1114 |
| Movement of Cattle from Drought Areas ... ..           | 6   | 922  |
| Native Agriculture ... ..                              | 5   | 663  |
| New Crops for Rhodesia ... ..                          | 2   | 217  |
|  | 6   | 902  |



## vii

|   | NO. | PAGE |
|---|-----|------|
| Notes on Agricultural Co-operation ... ..                   | 1   | 25   |
| Notes on Cattle Breeding ... ..                             | 1   | 83   |
| Oats in Southern Rhodesia ... ..                            | 7   | 1023 |
| Oil Factory ... ..  | 6   | 826  |
|   | 7   | 978  |
| Oil Mill in Rhodesia ... ..                                 | 4   | 513  |
| Oils—Vegetable ... ..                                       | 5   | 667  |
| Orchards Inspection Ordinance ... ..                        | 6   | 920  |
| Oxidation of Arsenical Dipping Fluids ... ..                | 4   | 579  |
| Parasites of Sheep in Northern Rhodesia ... ..              | 7   | 1004 |
| Pigs—Breeding and Feeding of for Bacon Factory Purposes ... | 3   | 358  |
| Pleuro-Pneumonia in Tati Concessions ... ..                 | 1   | 13   |
| Ploughing with a Robey Steam Tractor at Lanteglos Farm ...  | 2   | 207  |
| Possibilities of Closer Settlement in Matabeleland ... ..   | 1   | 47   |
| Possibilities of Ranching in Rhodesia ... ..                | 7   | 1013 |
| Potato Plants—Two Ladybirds Injurious to ... ..             | 1   | 77   |
| Potato Tuber—Diseases of and Selection of Sound Seed ... .. | 3   | 399  |
| Poultry Keeping in Southern Rhodesia ... ..                 | 1   | 105  |
|   | 2   | 241  |
|   | 3   | 423  |
|   | 4   | 588  |
|   | 6   | 914  |
|   | 7   | 1046 |
|   | 8   | 1187 |
| Preparation and Use of Concrete ... ..                      | 4   | 582  |
| Principle of Winter Feeding of Dairy Stock ... ..           | 7   | 1017 |
| Production of Pedigree Seed Maize ... ..                    | 3   | 408  |
| Proposed Orchards Inspection Ordinance ... ..               | 6   | 920  |
| Proposed Rhodesian Stockbreeders' Association ... ..        | 6   | 909  |
| Purchase of Fertilisers ... ..                              | 1   | 64   |
| Purchase of Stock for Farmers ... ..                        | 4   | 504  |
| Pure Seed Supply ... ..                                     | 3   | 342  |
|   | 3   | 350  |
| Quinine for Settlers ... ..                                 | 8   | 1118 |
| Railway Concessions to Farmer Settlers ... ..               | 6   | 828  |
| Railway Rate for Fresh Fruit ... ..                         | 7   | 978  |
| Railway Rates for Live Stock ... ..                         | 8   | 1121 |

|  | NO. | PAGE |
|--|-----|------|
| Rainfall—Comparative Schedule of ... ..  | 6   | 934  |
| Rainy Season in Southern Rhodesia ... ..   | 5   | 689  |
| Raising of Seedling Trees ... ..   | 4   | 561  |
| Ranching Heifers—Supplies in the Union ... ..  | 4   | 505  |
| Ranching—Possibilities of in Rhodesia ... ..   | 7   | 1013 |
| Rebate on Irrigation Material ... ..   | 1   | 10   |
| Reciprocity in Exports and Imports ... ..  | 1   | 10   |
| Reduction in Rate on Fertilisers ... ..  | 5   | 669  |
| Report on Experiments at Lochard Experiment Farm ... ..                                | 8   | 1161 |
| Report of Veterinary Conference, Bulawayo ... ..                                       | 2   | 251  |
|  | 3   | 436  |
| Reports on Methods of Growing, Curing and Selling Bright<br>Tobacco in Virginia ... .. | 3   | 385  |
| Reviews ... ..   | 3   | 450  |
|  | 5   | 764  |
| Rhodesian Charcoal ... ..  | 3   | 348  |
| Rhodesian Exhibits at Union Agricultural Shows ... ..                                  | 1   | 112  |
| Rhodesian Citrus Fruit—Exportation to London ... ..                                    | 2   | 23   |
| Rhodesian Citrus Fruit—Valencia Late Oranges on London<br>Market ... ..                | 3   | 47   |
| Rhodesian Hides ... ..   | 5   | 60   |
| Rhodesian Maize—Principal Types and Points ... ..                                      | 1   | 41   |
| Rhodesia and the War ... ..  | 7   | 1076 |
| Rhodesian Oil Mill ... ..  | 4   | 513  |
| Rhodes Trust Experiments ... ..  | 6   | 827  |
| Root Gallworm ... ..   | 1   | 10   |
| Rye ... ..   | 7   | 1051 |
|  |     |      |
| Salisbury Agricultural Show ... ..   | 1   | 6    |
| Scab ... ..  | 7   | 974  |
| Scab or Scabies in Sheep and Goats ... ..  | 7   | 1007 |
| Seedling Trees—Raising of ... ..   | 4   | 561  |
| Sheep in Rhodesia ... ..   | 4   | 511  |
|  | 4   | 552  |
| Sheep—Parasites of in Northern Rhodesia ... ..   | 7   | 10   |
| Slaughter Competition at Salisbury ... ..  | 1   | 10   |
| Simple Method of Raising Water ... ..  | 4   | 57   |
| Soils—Bright Virginia Tobacco ... ..   | 2   | 20   |
| Statistics—Agricultural ... ..   | 3   | 7    |
|  | 4   | 1    |
|  | 7   | 9    |
|  | 8   | 1122 |
|  | 8   | 1172 |
| Stock Feeding—Molasses for ... ..  | 3   | 347  |
| Stock—Purchase of for Farmers ... ..   | 4   | 50   |
| Stock—Importation of from England ... ..   | 1   |      |

|  | NO. | PAGE |
|--|-----|------|
| Stock—Importation of ... ..  | 7   | 975  |
| Stock—Some Notes on Systematic Dipping of ... ..                             | 7   | 988  |
| Stock Thefts ... ..  | 4   | 506  |
| Sunflower Cultivation ... ..   | 5   | 730  |
| Supplies of Ranching Heifers in Union Provinces ... ..                       | 4   | 505  |
| Testing and Inoculation of Cattle in Great Britain prior to<br>Export ... .. | 8   | 1183 |
| The Late Mr. D. R. Chatterley ... ..   | 7   | 974  |
| Third International Congress of Tropical Agriculture ... ..                  | 3   | 339  |
|  | 8   | 1117 |
| Thousand Guinea Trophy ... ..  | 1   | 115  |
| Tobacco ... ..   | 1   | 11   |
|  | 8   | 1129 |
| Tobacco Expert ... ..  | 7   | 975  |
| Tobacco Gift ... ..  | 8   | 1122 |
| Tobacco—Hints to Growers ... ..  | 7   | 1034 |
| Tobacco Industry ... ..  | 4   | 602  |
| Tobacco—Report on the Growing, Curing and Selling of in<br>Virginia ... ..   | 3   | 385  |
| Tobacco Sale ... ..  | 5   | 661  |
| Transplanting Tobacco Plants ... ..  | 8   | 1115 |
| Treatment of Bilary Fever in the Horse with Trypan Blue ...                  | 5   | 735  |
| Tropical Agriculture—Third International Congress ... ..                     | 3   | 339  |
|  | 8   | 1117 |
| Tsetse Fly Areas ... ..  | 1   | 11   |
| Tsetse Fly ... ..  | 4   | 568  |
| Twelve Simple Rules for Avoidance of Malaria and Blackwater                  | 1   | 121  |
| Two Ladybirds Injurious to Potato Plants ... ..                              | 1   | 77   |
| Umtali Co-operative Dairies ... ..   | 4   | 597  |
| Union Agricultural Shows—Rhodesian Exhibits ... ..                           | 1   | 112  |
| Vegetable Oils ... ..  | 5   | 667  |
| Veld Burning ... ..  | 5   | 664  |
| Veterinary Conference—Report on ... ..                                       | 2   | 251  |
| )  | 3   | 436  |
| Veterinary Reports ... ..  | 1   | 129  |
|  | 2   | 270  |
|  | 3   | 454  |
|  | 4   | 611  |
|  | 5   | 770  |
|  | 6   | 924  |
|  | 7   | 1061 |
|  | 8   | 1196 |



|  | NO. | PAGE |
|--|-----|------|
| Veterinary Research ... ..                 | 4   | 514  |
| Victoria Wheat ... ..                      | 3   | 347  |
| War ... ..                                 | 7   | 971  |
| Water Ordinance ... ..                     | 3   | 337  |
| Water Raising—Well Sweep or Shadoof ... .. | 4   | 577  |
| Weather Bureau ... ..                      | 1   | 138  |
|  | 2   | 281  |
|  | 3   | 463  |
|  | 4   | 621  |
|  | 5   | 779  |
|  | 6   | 935  |
|  | 7   | 1069 |
|  | 8   | 1205 |
| Weather Forecasting ... ..                 | 2   | 234  |
|  | 3   | 428  |
| Wheat—Early Gluyas ... ..                  | 8   | 1131 |
| Wheat—Victoria ... ..                      | 3   | 347  |
| Wheat—Winter ... ..                        | 5   | 668  |
| Winter Cereals ... ..                      | 2   | 193  |
| Winter Cropping of Moist Vlei Soils ... .. | 2   | 3    |
| Winter Wheat ... ..                        | 5   | 3    |
| Wool and Skins Market ... ..               | 8   |      |
| Wool Sales—Merino ... ..                   | 5   | 106  |



















